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INTERNATIONAL

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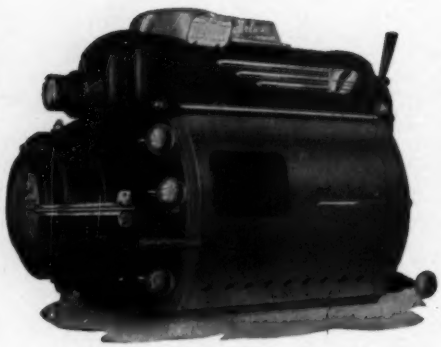

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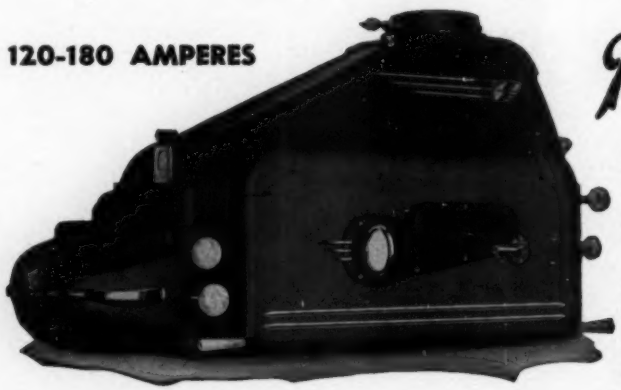

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HENRY B. SELLWOOD, *Editor*

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MONTHLY CHAT

PROJECTIONISTS may expect that the physical quality of theater release prints will slowly but steadily deteriorate before the opportunity for betterment presents itself. Despite official statement from the NPA in Washington that there is no serious shortage of raw stock "at the moment," leading laboratories report that the situation has come to the point where it suffers from various degrees of acuteness, with comment ranging from "tight" to "very acute." Some labs have decided against taking any additional orders at this time.

This is the situation right now, even though the needs of the military and other government agencies have by no means reached their peak. And the Tv nets' demands for stock will mount steadily.

All this means that there will be fewer prints available on any given release, with faster rotation of prints and consequent less time for inspection in the exchanges. Print quality is none too good right now, and exchange inspection has never been more than meager.

Print quality seems destined to provide plenty of trouble in the months to come, with projectionists having to take over more of the normal functions of the exchange. Close inspection of every print is requisite, and particular care should be taken to establish the nature of the stock—whether nitrate or safety. Eastman's new print identification system should help greatly in this direction (IP for March, 1951, p. 12). Proper splicing will play a very important role in licking this problem.

We're stuck with this problem, so let's face it squarely.

• • •

IP HAS LONG been inured to the circumstance wherein a long succession of its issues containing much material of merit will not elicit a congratulatory word from its readers, the while a minor error in, probably, an equation or the like will induce a raft of comments. 'Twas ever thus.

Of late a new note has been sounded: certain quarters opine that IP should shy away from "all this new stuff" and concentrate exclusively on the "now," since this peering into the future will "serve merely to create dissatisfaction with equipment now being offered."

IP just can't buy this line of thought. Current practice and improved technique in handling existing equipment will ever be a prime concern of IP, of course; but one of the chief reasons for the existence of IP is that it ferret out and publish information on the new and the novel. Any craft journal—and IP is just that, *not* a trade paper or a business paper—that fails in this vitally important function forfeits its right to exist.

IP is important only to the extent of the service it renders its readers.

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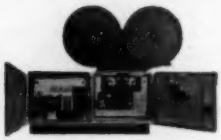

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INTERNATIONAL PROJECTIONIST

VOLUME XXVI APRIL 1951 NUMBER 4

Honeycomb-Condenser Lamp Optics

The appended article, in two sections, comprises a translation from the German by Robert A. Mitchell of an article "Die Wabenkondensor" in *Bild Und Ton* (Bd. 3, Nr. 4, S. 127) and supplementary comment by the translator. This material is published herein in line with the long-established policy of IP in providing a forum for the free and full expression of views by anybody having anything interesting to say anent the projection process. Comment on the appended article is invited.

By A. R. SCHULTZE
Zeiss-Ikon, VEB, Dresden

CRITICAL examination of picture reproduction in motion picture theaters unfortunately often forces one to the conclusion that the quality of the projection leaves something to be desired. Even though the necessary picture brightness can be attained in all cases by means of modern mirror lamps, insufficient uniformity of illumination and of the color of the picture are ever-present defects, the latter being especially troublesome during the presentation of color films.

The cause is to be sought in several factors which lie as much in the lamp optics as in the quality of the carbons used and in the attention given to the operation of the lamp.

The claim is here advanced that the disadvantages of conventional lamps may be considered obviated by the *honeycomb condenser* optical system. With this system the slight falling-off of illumination at the edges of the picture, the sensitivity of the lamp optics to trim-position and burning errors, as well as color variations in the picture with the use of Beck [high-intensity] carbons, are overcome.

In the conventional mirror lamp the luminous crater of the positive carbon is imaged on the picture-aperture by the mirror, the path of the rays being shown in Fig. 1.

FIG. 1. Representation of an arclamp optical system using a concave mirror.

Irregularity of Illumination

Every irregularity in the crater and every alteration in the position of the crater image [the "spot"] cannot help but result in an irregularity in the illumination of the picture, especially when high-intensity carbons are used. Slantwise burning of the carbon shows up on the screen as colored corners and edges, the reason being that the crater, when viewed across the white gas-ball, has a yellowish to reddish color.

And especially when low-current intensities are employed, the correct imaging of the crater and its position relative to the mirror must be maintained very precisely, and to a degree of accuracy not feasible in practice. Hence screen illumination free from defects is no longer attempted with currents under 40 amps because of the small area of the positive crater.

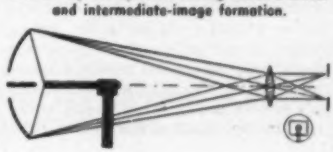
These disadvantages are avoided with the familiar condenser-utilizing lamp optical-system, the so-called *Kohler arrangement*, because with this system it is not the picture-aperture but an interposed auxiliary condenser upon which the crater of the positive carbon is imaged. And the condenser, in turn, images the "principal condenser" [a large condensing lens analogous in function to a lamp mirror] upon the aperture.

With this system, also called the "intermediate image-formation arrangement," no influence upon the illumination is exerted by incorrect position or oblique burning of the positive carbon, as the image of the principal condenser, not that of the crater, lies on the picture-aperture. In consequence of the low efficiency of a condenser system, the application of this type of arc-imaging for projection in motion picture theaters has not succeeded until the present time.

New Condenser a Requisite

It might be supposed that we could at once set about applying this system to a mirror lamp, as shown in Fig. 2. But this is not possible because a dark shadow, originating from the carbon-holder and carbon which naturally lie between the

FIG. 2. Optical system utilizing concave mirror and intermediate-image formation.



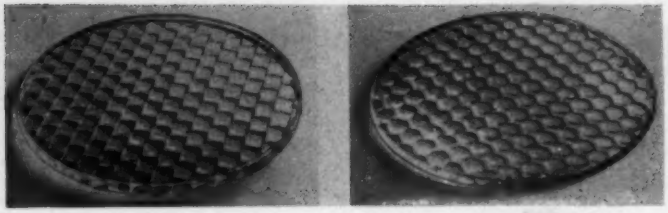


FIG. 3. Lens plates holding an array of 150 individual lenses: rectangular and hexagonal plates.

mirror and the intermediate condenser, is visible on the picture-aperture. The intermediate image-formation setup just represented can be realized, however, if the so-called honeycomb condenser is used. This consists of two lens-"holding" plates, as shown in Fig. 3.

These will be interposed at a definite place in the light-beam of the mirror lamp, as shown in Fig. 4. Each lens plate has the same number of lenses. Now, the arrangement of the separate lenses is so contrived that each lens of one plate is coordinated with a lens of the second plate. That is, the focal lengths of the lenses of the first plate are chosen so that each lens always forms an image of the crater in the corresponding lens of the second plate.

The lenses of this plate, in turn, will image every corresponding lens of the first plate on the aperture of the projector. All images of the individual lenses of the first lens-array accordingly superimpose themselves on the aperture. Thus with this intermediate image-formation system the whole of the light-beams coming from the mirror is subdivided into a large number—about 150—single light-beams.

In conformity to their practical application, the lenses of the first plate are rectangular, their images corresponding in size and shape to the picture aperture; lenses of the second plate are hexagonal, approaching the circular form of the arc crater.

The manifold subdivisions of the light-beam by the honeycomb-condenser system has the great advantage of retaining the desirable characteristics of the intermediate image-formation system.

High Operating Efficiency Assured

Due to the fact that the desirable properties of the intermediate image-formation system are retained, the manifold subdivision of the light-beam by the honeycomb-condenser system has the great advantage that one can utilize fully the high operating efficiency of a concave mirror without a shadow of the carbon-holder or the carbon showing up. The single lenses of the first array are indeed partially covered by this shadow; but this non-uniformity is obliterated at the aperture by virtue of the fact that the images formed by 150 individual lenses are superimposed.

In line with the characteristics of the intermediate image-formation system, there is also considerable independence from the exact imaging of the crater. Sidewise burning of the crater, for instance, is not perceptibly detrimental to the uniformity of the illumination of the picture aperture. Moreover, it is also possible to attain uniform picture illumination with lower currents, *i.e.*, a smaller crater.

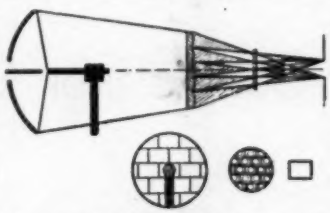


FIG. 4. Optical system which utilizes the "honeycomb" condenser.

This mirror combination, therefore, has the following advantages:

1. Continuously uniform and color-free picture illumination, even with faulty carbon positioning and imperfect imaging of the crater, rendering unnecessary the otherwise customary attention to the arc and mirror knobs for truing up picture quality during projection.

2. Use of Beck (h-i) light even with currents from the present minimum down to 15 amps, so that h-i light, the superiority of which is well known—in particular for the projection of color films—can be employed even in the smallest theater.

Not only does the honeycomb-condenser system bring about important operational advantages, but very likely a substantial simplification of the construction of mirror arc-lamps, too.

No Guides, Position-Controls

Guides and position-controls for the carbons and for the mirror are no longer necessary, since their precise position no longer has any great significance. It suffices if the carbons are fed at their ends by the carbon supports. Focusing knobs for the mirror can also be dispensed with. If such a lamp is once lined up correctly at the factory, no operating adjustments for maintaining picture quality are necessary during the time that the lamp is in use.

The Ikosol honeycomb-condenser lamp manufactured by Zeiss Ikon VEB, Dresden, is shown in Fig. 5. This lamp is equipped with such customary accessories as an automatic carbon feed, combination arc-striking and light-beam dousers, as well as a latch-release device for the carbon holders. For use the lamp comes with an aspheric mirror of 300 mm. [11.811 inches] diameter.

Evaluating the Honeycomb-Condenser Lamp

By ROBERT A. MITCHELL

THE introduction of the Zeiss Ikosol honeycomb-condenser lamp goes far toward meeting two very important needs, from the point of view of Soviet-German motion picture technologists. The first is the need for satisfactory screen illumination—which need is universal and was recognized by INTERNATIONAL PROJECTIONIST years ago. The second is the need, they feel, for decisive

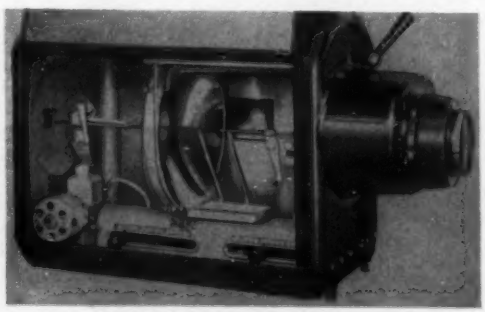


Fig. 5. The Zeiss Ikosol honeycomb-condenser lamp. Note lightness and simplicity of this lamp.

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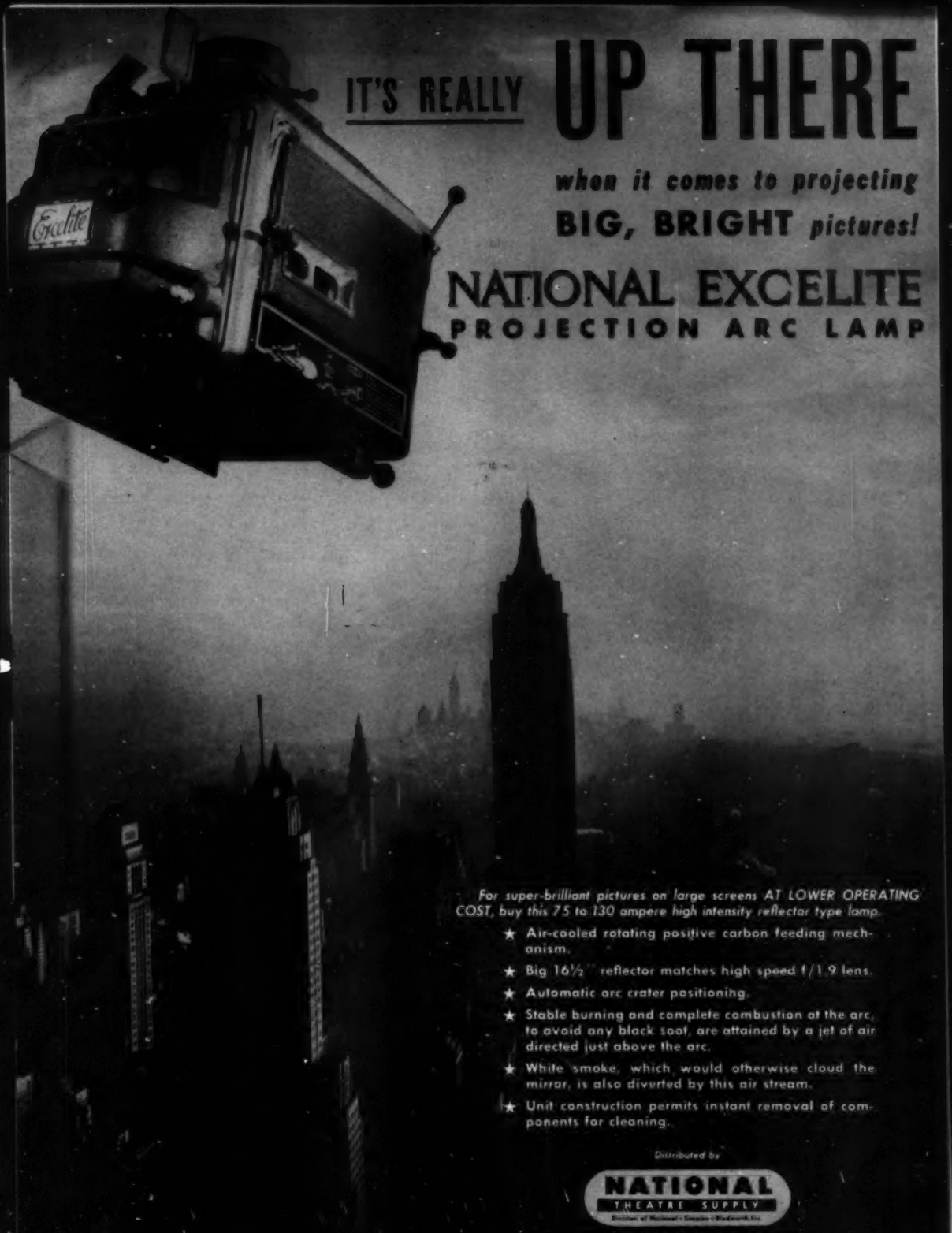
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Soviet superiority in *all* technological fields.

Indications that this second need is being met with increasing success on the other side of the Iron Curtain may well be viewed with alarm by the Western world. The implications are both economic and military.

Among other recent East-German successes in motion picture technology we find simplified stereophonic sound systems, experimental stereoscopic movies, improved soundhead optics, wide-latitude color processes, specially perforated filmgate runners which "cushion" the film and prevent deposits of wax and emulsion, and cameras and projectors of new design.

The well-known Agfa Film Corp., now resuscitated and completely Sovietized (as is everything else in East Germany), gushes forth an output of raw stock which is nothing short of prodigious. A new projector by Ernemann (the Model 10) is soon to have its début—an incidental reflection of technical know-how of the highest order—and an increase of East-German steel production from 500,000 to 6,000,000 tons per annum in the past four years.

American Manufacturers' Concern

These developments should gravely concern British and American manufacturers of theatre equipment because the Eurasian equipment may be superior to Western makes in quality and performance. It will certainly be lower in cost, especially to exhibitors in dollar-short countries. America has already lost its supremacy in the production field. Is history to repeat itself in the technological field? The answer to this question will not be long in coming.

The time to make much-needed advances in American and British projection technology is NOW! Five years from now, three, or even *one year* from now may be too late.

Whether or not "movies are better than ever" is a matter open to dispute; but it's a safe bet that movies are no better than the quality of the projection that puts them on the screen. The best productions—films that the theatre-going public *wants* to see, and to see *at their best*—are being sabotaged daily in thousands of theatres by antiquated and run-down projection and sound equipment.

Faulty Projection Widespread

Faulty screen illumination, picture flicker, fuzzy images, and sound suggestive of Edison's talking machine reign malignantly in countless neighborhood theatres, the mainstay of the film industry. Rotten projection, like rotten pictures, means rotten business at the box-office!

Now, the real rub is that these persistent gremlins cannot always be banished by the simple expedient of replacing old equipment with new. The new may be nothing but a rehash of the old, a factory-fresh materialization of pre-war—yes, even pre-sound—concepts of design. There are excellent projectors, lamps, and sound systems, to be sure; and for every theatre there is a "best" make and model of projection equipment. But could not, *should not*, the "best" be superseded by a "better"? Is the best really good enough to meet todays exacting patron requirements, to meet standards of projection higher than those commonly considered official, to meet competition in the entertainment field, to meet the stiff competition offered by equipment of Eurasian manufacture?

This competition will soon be in evidence on the foreign market. And just as foreign films are enjoying an increasingly warm reception by intelligent American audiences, the possibility that foreign-made theatre equipment will infiltrate into the Americas on its *own merits* actually exists! Canada and South America are already fertile fields for such an invasion.

American Conservatism Noted

The writer has expressed the opinion several times in the past that many manufacturers of theatre equipment have shown themselves strangely, even unreasonably, reluctant to institute *substantial* improvements in projector design. Such improvements have been made, of course, and in the United States by every projector manufacturer.

On the whole, however, a conservatism prevails which makes the real advances appear minuscule when viewed against the protracted periods of time required for their development and commercial introduction.

For example: how many projector manufacturers have seriously considered replacing the orthodox 3-to-1 intermittent movement with a 5-to-1 movement in order to take advantage of the flicker-reducing 3-blade shutter? Have exhaustive tests been conducted with the buckle-eliminating curved picture gate?

Then, too, the use of bulky and heavy sound "heads" separate from the picture mechanism can be criticized on very logical grounds. Motion pictures are no longer run "straight silent." Why, then, are picture mechanisms constructed as "silent" machines without integral sound-reproducing components? Such attachments add very little to the total bulk of a projector mechanism, as the German Ernemann VII-B, the Dutch Philips, and the American DeVry clearly demonstrate. A very desirable simplification results.

Screen Light Distribution

As important as any possible improvement of the projection process is the attainment of screen illumination which is uniform (from 90 to 95% side-to-center distribution) and is reasonably free from discolorations. This problem has been recognized as mighty important by projection engineers in Germany, but *not* in the United States and Great Britain. The work and opinions of Zeiss engineers simply cannot be laughed off or brushed aside as of no consequence.

Three distinct methods of obtaining uniform screen illumination have now been presented in IP. First, the Ventarc optical system specially designed for a

(*Continued on page* 34)

[1] "The Ventarc H. I. Carbon 'Blown' Arc: a New Concept" by Dr. Edgar Gretener; IP for July 1950, p. 13. "Uniform Screen Light Distribution; Elliptical Reflector Mirrors" by Sam Glauber, Dr. E. Gretener, and R. A. Mitchell; IP for September 1950, p. 13.

[2] "Optics of the Projection Arc-Lamp"; IP for February 1951, p. 5.

Projectionist Examination Questions

Based on Examinations by Leading U. S. Municipalities

1. A rheostat is rated at 1250 watts and has a resistance of 2 ohms. This rheostat may carry. at rated conditions, how many amperes?

2. An imaginary straight line passing through the exact center of a lens or of all the elements of an optical system is called ————?

3. In a 35-mm projector running at 90 ft. per minute, how many frames of film pass the aperture in one minute?

4. What per cent of the stamped rating is the *actual* rating of a link fuse?

5. A projector carbon having no core is called ————?

6. What is "voltage drop"?

7. Give the allowable carrying capacity of at least five different sizes of wire with which you are familiar.

8. What is the resistance of a wire that has a 3½-volt drop when carrying 45 amperes?

9. How many amperes are flowing in a wire with a resistance of 1/25th ohm if there is a drop of 2 volts in it?

10. Describe the method by which dry and brittle film may be cleaned and moistened.

11. What is the maximum current-carrying capacity for a 7-mm Suprex positive carbon? For an 8-mm?

12. What may cause the repeated pencilling of the negative carbon?

Tv Won't Ruin Everything*

By RUPERT HUGHES

BILL NYE, now forgotten, but once a household word for popular humor, told of going into a cheap restaurant for breakfast. A cross-eyed waitress first cleared away the debris left by the previous customer, and brushed the crumbs into Bill's lap. Then she turned on him and snapped: "Tea or eggs?" That is all there is to the story.

Nobody seems to think it odd that everybody is always saying tea-or-egg things, like: "Shall we have the theater or the moving picture?" "Shall we have classical music or popular?" "Shall we have motion pictures or radio?" "Shall we have radio or television?"

When Bill Nye heard the cross-eyed waitress exclaim "tea or eggs" his instinct was to say, "Tea *and* eggs, also a lot of other things." But when we are asked, "Shall we have motion pictures or television?" it is not taken as a bad joke but as an inevitable and perilous choice. Television is being hated and denounced, and the cold war over it is getting as hot as the long struggle with Russian communism. Television is being viewed as the fatal enemy of everything dear and artistic, profitable and moral.

The 'Pernicious' Bicycle

I am old enough to remember when the craze for bicycles "killed" the theaters, the church, the concert hall and reading habits at home. It also ruined the morals of boys and girls, since it enabled them to get far away from home.

After the bicycle had served its time as the explanation for the failures of such books, plays, concerts and other merchandise as failed to do well, the automobile came along. It was blamed for ruining the publishing business, the theatrical and concert business, and the morals of boys and girls, since it enabled them to get even farther away from home than the bicycle. The motorcar was considered to be a sort of bedroom and barroom on wheels, and it could park wherever it was dark.

After the automobile had established itself as an institution that could not be sermonized or editorialized away, the motion picture house came along to take the blame for everything deplorable. The nickelodeon and the vast palaces it developed into, were plainly the reasons why nobody stayed at home to read or went to the legitimate theater, or even attended vaudeville or burlesque. The motion picture was castigated for cutting down church attendance, which has never been satisfactory in any age. Furthermore, dramatic critics reviled the unpardonable cinema almost as violently as the parsons did. Critics who hated most plays spoke of the theater as a temple of high art when they contrasted it with the motion picture houses.

The Onslaught of Radio

Next came radio! It went down the line like a bowling ball, sending all nine of the ninepins flying in a strike. People stayed at home, but they did not read books or magazines or newspapers. They listened to serials, soap operas, music, news, science, comedy and plays. They absented themselves from church, wrestling matches, prizefights, baseball and football games, gambling clubs, night schools, saloons, lectures, grand and comic operas, tragedies, comedies, vaudeville, burlesque, family reunions, and everything else. People lost their eyes and legs from disuse and became all ears.

But cheer up, the worst was yet to come! Television!! That not only killed off everything that radio had killed off, but also killed off radio. People stayed at home more than ever, but not to read. They forgot all the arts and the pleasures even of conversation. Television brought back only one thing, the barroom. It made beer and hard drinks popular once more, since people had to put up some excuse for leaning on the rail half the night staring goggle-eyed at television's one bright eye.

So now today the book publishing business is dead; the theater business is dead in all its branches; the churches and lecture halls are empty; the motion picture houses are dark and silent. The football fields, boxing arenas and racing parks are half empty. And the radio sets are gathering moss.

Some Outstanding Exceptions

Of course, there are exceptions, though nobody mentions these. Some of the churches are packed; some of the legit theaters are doing $50,000 a week; many of the motion picture houses are jammed with eager multitudes; some of the books are having enormous sales; some of the magazines have circulations of millions; some of the newspapers are almost too heavy to lift.

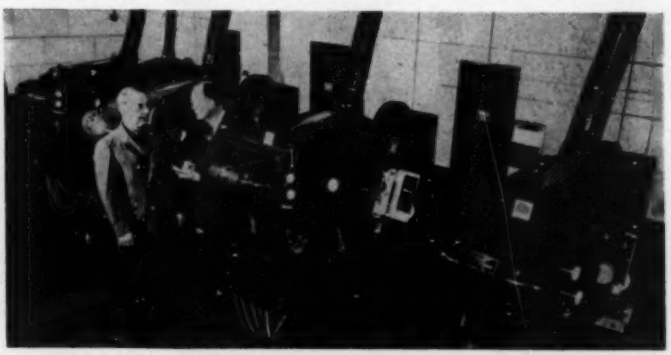
But the denouncers of the plague of television forget that, long before television, radio, motion pictures, automobile or bicycles were even heard of, most churches were sparsely attended; most theaters housed failures; most books died in the store-rooms; most magazines and newspapers perished of pernicious anemia; most poets, painters, playwrights, actors, sculptors, evangelists, singers died of starvation or earned their livings in other fields.

It was not until shortly before Columbus discovered America that books began to be printed from movable type and, doubtless, that innovation was also denounced for destroying the livelihood of strolling minstrels, strolling players, strolling friars, copyists and illuminators.

One other thing has always been true. While the blind poet, Homer, begged for bread for his songs, other rhapsodists became favorites of wealthy patrons and lived in luxury. Actors have always been looked on as more or less beggars in

(*Continued on page* 32)

FAMED MUSIC HALL (N. Y.) REFURBISHES WITH 4-PROJECTOR INSTALLATION



Installation of 4 Simplex X-L projectors in Radio City Music Hall (New York) is discussed by Chief Projectionist Charles Muller (left) and Arthur Meyer, sales chief for International Projector Corp.

* This engaging dissertation appeared in the 45th anniversary issue of *Variety* and is reproduced here by permission of that journal.

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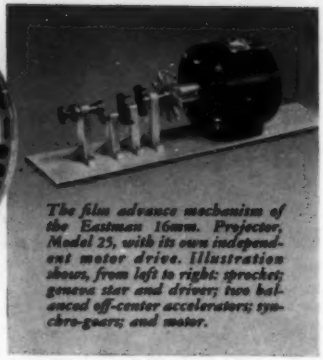

The film advance mechanism of the Eastman 16mm. Projector, Model 25, with its own independent motor drive. Illustration shows, from left to right: sprocket; geneva star and driver; two balanced off-center accelerators; synchro-gears; and motor.

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of your 16mm. FILMS . . .

Eastman 16mm. Projector, Model 25, adapted for tungsten illumination.

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West Coast Division
6706 Santa Monica Blvd.
Hollywood 38, California

Comparative Data Anent Nitrate, Safety Film

The appended article complements the data which appeared in IP last month ("New Eastman Identification System for Safety Film," p. 12) and similarly was prepared and is copyright by Eastman Kodak Co. Comment from the field is invited.

THE hazardous properties of nitrate film have been well known and understood in the motion picture industry for a long time. Safe practices in the handling and storing of nitrate film have been worked out over the years by the cooperative efforts of various organizations, the National Bureau of Standards, the National Fire Protection Association, the National Board of Fire Underwriters, the Underwriters' Laboratories, the Motion Picture Association of America, and the film manufacturers.

Today everyone working in the motion picture industry—whether in studios, laboratories, exchanges, theaters, or projection rooms—is made acquainted with the hazard of nitrate film and with the proper precautions required to handle it safely. As a result, film fires are now remarkably few, and the occasional ones which do occur are usually extinguished quickly with a minimum of loss from personnel injury or property damage.

Advantages of Safety Film

Despite the relatively good safety record in the industry in recent years, a less hazardous film has been a long-sought goal. Its universal use would practically eliminate the chance of a dangerous fire, and it would make possible less rigid safety regulations, less expensive construction, and lower fire insurance rates.

The so-called "safety base" or acetate films available prior to 1947 did not have satisfactory physical properties for general theater use. However, now that an improved type of safety support (high acetyl cellulose acetate) suitable for theaters is available in quantity, the use of nitrate motion picture film in the United States is rapidly declining, and existing safety regulations may gradually be moderated.

Concern is felt in many quarters that with the time approaching when most motion picture film will be on safety support, but with substantial quantities of nitrate film still in use or in storage, safety precautions may be relaxed too soon or a mistake in identity may be made and a disastrous fire result.

Hazards of Nitrate Film

The hazardous properties of nitrate film have been described frequently and in detail in the past and are given only briefly here. The most dangerous aspects of nitrate film are its ease of ignition, its very high rate of combustion, and the fact that the gases given off are extremely poisonous and, under some conditions, explosive.

Nitrate film decomposes readily when heated above room temperature even below the ignition range. The decomposition is both exothermic and autocatalytic, and once it starts it goes faster and faster. The quantity of heat produced is such that, if not dissipated, it may rapidly raise the film temperature to the ignition point. Even local heating at one point can raise the temperature of the film to a dangerous level, thus initiating decomposition in the entire mass.

Cellulose nitrate also contains enough oxygen within the molecule so that decomposition or combustion proceeds rapidly even in a limited air supply, and a nitrate film fire cannot be extinguished by smothering.

Nitrate Ignition Temperature

Nitrate film itself is not explosive and is less flammable than certain other nitrated compounds. The ignition temperature of nitrate film is generally given as about 300 F, but the exact value depends on the time of exposure, the size and purity of the film, and other factors.

Figure 1 shows that in a laboratory ignition test, a sample of fresh nitrate film base which ignited in 80 seconds in air at 325 F, ignited in 10 seconds at 400 F, and in 3 seconds at 500 F. Chemicals left from processing, dirt, and other foreign materials can lower the ignition temperature.

The Chemical Warfare Service investigation following the Cleveland Clinic disaster (a nitrate X-ray film fire) in 1929 showed that temperatures of 100 C (212 F) were unsafe for nitrate film, and that exposed steam pipes, unprotected electric light bulbs, etc., were dangerous in rooms containing nitrate film. Nitrate film improperly cared for has caused fires after several hours storage at temperatures as low as 120 F. Spontaneous ignition is also believed to be responsible for a number of nitrate film fires which have occurred in storage vaults in summer following periods of 100 F weather.

The actual heat of combustion of ni-

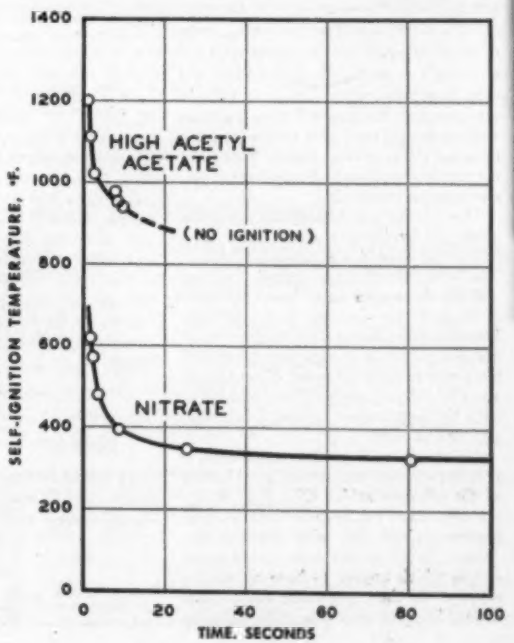


FIGURE 1

Self-ignition temperature in air of Eastman nitrate and high acetyl acetate (safety) motion picture positive film support. American Standards Assoc. test method.

Gases	Per cent by volume
Nitric oxide (NO)	1.4-8.2
Nitrogen dioxide and tetroxide (NO_2, N_2O_4)	6.9-8.9
Carbon monoxide (CO)	47.7-59.1
Carbon dioxide (CO_2)	21.3-24.5
Oxygen (O_2)	none
Hydrogen (H_2)	0.9-3.2
Methane (CH_4)	1.0-2.7

TABLE I†

Gases evolved in flameless combustion of nitrate film. (Volume of combustion chamber: 8 to 27 cubic ft. Weight of film: 2 lbs. per cubic ft. of chamber.)

† From "Proceedings of a Board of the Chemical Warfare Service appointed for the purpose of investigating conditions incident to the disaster at the Cleveland Hospital Clinic, Cleveland, Ohio, on May 15, 1929." U. S. Government Printing Office, Washington, 1929.

trate film is low compared with that of some of the common fuels, as indicated:

	Heat of Combustion B. T. U. per Lb.
Nitrate Film	**6000-8000**
Wood	**8000-9000**
Alcohol, denatured	**11,620**
Coal, bituminous	**10,000-14,000**
Gasoline	**20,750**

However, the *rate* of combustion of nitrate film is about 15 times that of wood in the same form, so that the heat evolved per minute is initially much greater. This results in a rapid rise in temperature and a very intense fire. A nitrate film fire burns so fiercely and spreads so quickly, it is virtually impossible to control or extinguish it except by automatic water sprinklers.

Gases From Ignited Nitrate Film

When a single layer of nitrate film is ignited and allowed to burn freely in an excess of air, it burns with a bright yellow flame; but the gases given off are colorless. These are chiefly nitrogen, carbon dioxide, and water vapor, none of which is poisonous or explosive. If the air supply is restricted, as is always the case in practice where film is in rolls in any quantity, the film will burn (with or without flame) and give off large quantities of thick, yellow fumes. These are extremely poisonous and may form explosive mixtures with air.

The relative amounts of various gases given off by burning nitrate film in a limited air supply are shown in Table I. Traces of the lethal hydrocyanic acid gas (HCN) have also been found but only in insignificant amounts. Complete combustion yields about 4 to 5 cubic ft. of gas per pound of nitrate film at normal temperature and pressure. The proportions of these gases will vary somewhat with the temperature, pressure, air supply, and so forth.

The toxicity of carbon monoxide is well known; but the physiological effects of the nitrogen oxides (NO, NO_2, N_2O_4) are even more insidious because of their greater toxicity and delayed action. Exposure to concentrations of nitrogen oxides which appear to have no serious effect at the time, frequently cause death several hours or days later. This occurred in a number of cases in the Cleveland nitrate film disaster in 1929.

The simultaneous exposure to nitrogen oxides and carbon monoxide is particularly serious, since these gases have an additive toxic effect, the ultimate result of which is to deprive the body of its supply of oxygen. The relative toxicity of nitrogen oxides, carbon monoxide, and carbon dioxide is shown in Table II.

Safety Film Characteristics

So far, all commercial safety motion picture film supports have been made from cellulose acetate or the mixed acetate-propionate or acetate-butyrate cellulose esters. It is sometimes thought that the term "safety film" implies that these films do not burn. Actually all of these safety films will burn slowly if held in a flame, but will generally cease burning soon after the flame is removed. They are called safety films because they are so very much less hazardous than nitrate film—the ignition temperature is much higher, the burning rate so much lower, and there is no danger from nitrous fumes.

Cellulose acetate film starts to decompose with evolution of fumes at 500 F, compared with only 200 F for nitrate film. The ignition temperature usually given for acetate film is about 800 F, compared with 300 F, for nitrate film. Our laboratory tests (Fig. 1) show the high acetyl acetate film base to ignite in 9 seconds at 950 F, and in 2 seconds at 1100 F. At 930 F the film decomposes but does not ignite in this test.

The thermal decomposition of acetate film is neither exothermic nor autocatalytic. Furthermore, the burning rate of acetate film is only about 1/20 that of nitrate film. This means that acetate film is difficult to ignite and, if ignited, is easily extinguished by water or smothering. Cellulose acetate plastics containing some of the common types of plasticizers burn about as fast as paper in the same form and quantity.

Flame-Retarding Plasticizer

However, acetate motion picture film base made by Eastman Kodak Co., contains a flame-retarding plasticizer which greatly slows down the burning. Modern safety films actually burn much less easily and less rapidly than paper or wood in the same form and quantity.

The gases given off when acetate film burns (Table III) are about the same as those given off by burning wood. Of these, carbon monoxide is the greater hazard, although the other gases may produce suffocation or even severe lung irritation if inhaled in sufficient quantity. If acetate film is burned in an ex-

TABLE II*

Toxicity of the more important gases evolved in combustion of nitrate film.

Symptoms	Parts per Million Parts of Air		
	Nitrogen Oxides	Carbon Monoxide	Carbon Dioxide
1. Slight symptoms after several hours or maximum concentration for 8 hours exposure	30-40	100-200	5,000-30,000
2. Maximum concentration tolerated for 60 minutes without serious disturbance	50-100	450-900	33,000-60,000
3 Dangerous to life in 30 to 60 minutes	100-150	1500-2000	33,000-80,000
4 Kills most animals in short time	240-700	4000 or over	50,000-300,000

* From Jacobs, M. B., "The Analytical Chemistry of Industrial Poisons, Hazards and Solvents." Interscience Publishers, Inc., New York, N. Y., 1941 and 1949.

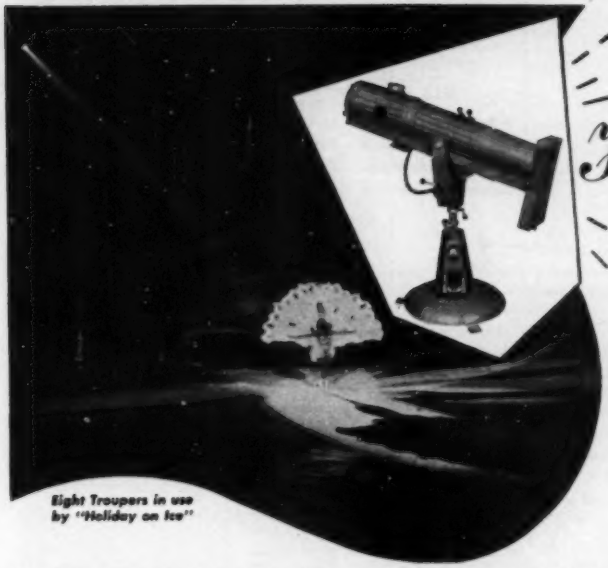
TABLE III†

Gases evolved in combustion of cellulose acetate (safety) film.

Gases	Physiological Effect
Carbon monoxide (CO)	Toxic
Carbon dioxide (CO_2)	Suffocating
Hydrogen (H_2)	Suffocating
Methane (CH_4)	Suffocating
Acetic acid (CH_3COOH)	Irritating and Suffocating
Aldehydes	Irritating and Suffocating
Ketones	Irritating and Suffocating
Alcohols	Irritating and Suffocating

† From Nuckolls, A. H., and Matson, A. F., "Some Hazardous Properties of Motion Picture Film," J. Soc. Mot. Pict. Eng., 27, 657-661, December 1936.

Editor's note: Gases present in trace amounts only are not shown in this table.



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	Underwriters' Laboratories Limits for Approved Slow-Burning Film	Eastman Nitrate Film, Type 1302	Eastman High Acetyl Acetate Film, Type 5302	Newsprint Paper	White Ledger Paper
Thickness, inches		0.006	0.006	0.002	0.005
Burning time, sec.	65 sec. (minimum)	5	105	11	21
Flame height, inches		50	10	20	17
No of times re-ignited		0	2	0	0

TABLE V

Burning tests on motion picture film made by the Underwriters' Laboratories method

cess of air, the carbon monoxide would be converted to carbon dioxide; but in a restricted air supply, some carbon monoxide would be present.

In short, the hazard presented by burning acetate film is about the same as that of burning wood, where the smoke is irritating but not dangerous unless confined in an unventilated space. It is not in any way comparable to the hazard of burning nitrate film.

Tests for Safety Film

Since all films other than nitrate might not be sufficiently free of hazard, the American Standards Association has drawn up laboratory test methods and specifications for safety photographic film designated ASA Z38.3.1-1943. According to the ASA definition, photographic films are classified as safety films if they are (1) difficult to ignite (2) slow burning, and (3) low in nitrogen content.

Results of tests made on nitrate and safety Eastman Motion Picture Positive Films by the ASA procedures are given in Table IV and show the wide differences between the two types of film.

The Underwriters' Laboratories describe approved slow-burning photographic films as follows: "Hazards in use and storage are small, being somewhat less than those presented by common newsprint paper in the same form and quantity."*

The Underwriters' Laboratories test procedures for classifying films as slow-burning differ in some respects from those of the ASA. For example, the Underwriters burning test is made on a strip of film held vertically instead of horizontally as in the ASA procedure, which is a more severe test. The Underwriters' Laboratories also measure the ignition temperature rather than the ignition time.

Comparison of Burning Tests

In Table V are the results of burning tests made by the Underwriters' Laboratories method on both nitrate and acetate Eastman Motion Picture Positive Film and on two types of paper. It may be seen that acetate film burns very slowly compared with nitrate and must be re-ignited several times. Acetate film is also much slower burning than either newsprint paper or ledger paper (which is closer to the film in thickness). Note that paper does not meet the rigid requirements of the Underwriters' Laboratories for approved slow-burning photographic film.

Soviet to Widen Film Standard?

Rumors in international technological circles have it that the Soviet government is considering changing the width of standard motion picture film from 35 to 40 mm and of constructing projectors in such a way that the different sizes of sprockets would not be interchangeable.

The reason given for the change, reports state, was the need of extra film width for stereophonic sound tracks, but the cynics think that the real reason is to make unusable naughty capitalist films without costly adjustment from 20 to 24 frames per second.

* "List of Inspected Gas, Oil, and Miscellaneous Appliances," Underwriters' Laboratories, Inc., Chicago, Ill., November 1947.

	ASA Limits for Safety Film	Eastman Nitrate Film, Type 1302	Eastman High Acetyl Acetate Film, Type 5302
1. Ignition time at 300 C., minutes	over 10	0.04	Infinity (Does not ignite)
2. Burning time, seconds	45 (minimum)	9	Infinity (Self-extinguishing)
3. Nitrogen content, per cent	0.36 (maximum)	10.8*	0.02-0.05

TABLE IV

Tests for safety motion picture film made by American Standards Assoc. methods.

* The nitrogen content of the un-plasticized cellulose nitrate is approximately 12%.

New Plastic Correcting Lens

The largest lens for a Schmidt optical system ever manufactured commercially, an essential part of theater television systems, is now being made by Polaroid Corp. at Cambridge, Mass. Designed to make a giant Tv picture, 15 x 20 feet, look as sharp as it would appear on a living room Tv set, the 22½-inch lens is cast from liquid plastic. The RCA theater Tv system using the new correcting lens is already installed in a dozen widely-separated theaters across the nation.

This new lens, based on a design by the late Dr. Bernhard Schmidt, is twice the size of any previously produced for a mass market, and its cost is described as "only a small fraction" of the cost of a similar glass lens.

Used in an observatory camera, such a lens bends the light of the stars so that a mirror can bring them to perfect focus on the photographic plate. The RCA theater Tv system uses the same

Polaroid's new 22½-inch lens for sharpening up theater Tv images.

principle in reverse to project a Tv image from a spherical mirror without distortion or imperfect focus around the edges.

The special process used requires no grinding or polishing of the lens surfaces. The process produces the required shallow curve, almost imperceptible at a casual glance, but accurate to 1/20th the thickness of a sheet of tissue paper. It is emphasized that the lens is a plastic, not Polaroid glass.

Peerless Lamp Data Sheets Available

A series of highly informative technical bulletins on Peerless carbon arc lamps is available through J. E. McAuley Mfg. Co., 554 West Adams St., Chicago, Ill. Far from the conventional type of descriptive literature, these booklets are in effect detailed instruction data covering the installation, operation and maintenance of the various units.

Interference Mirrors for Projection

NUMEROUS requests from projectionists for data anent interference mirrors for arc projectors, which IP printed in an issue of last Fall which is no longer available,* prompt the publication of the appended summary of this important development.

In projecting films by arc light a great deal of energy is concentrated on the small film area. The useful light is attended by heat and near-violet rays. By placing a heat-absorbing filter between the light source and the film, or by the use of interference filters, it is possible to restrict the transmission of the unwanted radiations over a limited band.

A much more complete separation between light and heat can, however, be obtained if the interference filter is arranged to reflect only the light and to transmit the infrared and ultraviolet radiations. By such an arrangement only the light is reflected in the direction of the film; the other bands of radiation penetrate through the mirror and so escape at a lower concentration by the rear.

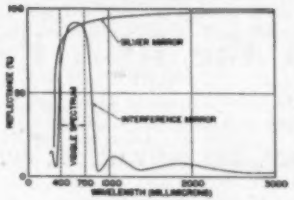
Coatings on Back of Glass

In order to provide protection against arc sputtering, etc., the coatings are applied to the back of the glass. From 4 to 11 superimposed coatings of transparent and semi-transparent materials are used, selected so as to have alternately low and high refractive indices.

Curves of comparative effects between ordinary metallic and multi-layer mirrors indicate an astonishingly efficient and clear-cut performance for the latter over the range of the visible spectrum, with a rapid fall-off between 750 and 850 millicrons where the coatings cease to reflect. It is this ability to provide a clean cutoff of unwanted rays which is an outstanding feature of this improvement over the usual heat and ultraviolet filters.

Glass Breakage; Color Quality

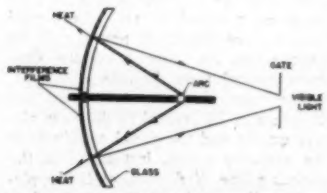
Another advantage of such mirrors is that they eliminate the problem of breakage of heat-glass. Since the interference films absorb little radiation, and since they are distributed over the large area of the mirror blank, they do not get nearly so hot as a heat-absorbing glass. Actually, the absorption of infrared by the glass mirror blank itself is largely responsible for the temperature rise observed.



The spectral reflectance of a multi-layer interference film compared with that of the conventional silver film.

Probably the most important advantage these mirrors have over a silvered mirror used with a heat-absorbing glass is the control that can be attained over the color quality of the light. By proper adjustment of the thickness of the interference layers, the color of the reflected light can be varied over a wide range. This factor is of major importance for the projection of color film.

* November, 1950, p. 12.



Simplified diagram showing positions of the arc, the mirror and the gate.

SMPTE's 69th Convention in N. Y. Week of April 30-May 4

More than 60 technical reports and discussions are scheduled for the 69th semi-annual convention of the Society of Motion Picture and Television Engineers which will be held in New York City at the Hotel Statler for five days from April 30 through May 4.

Of particular interest to the exhibition field, and especially to projectionists, will be the symposia to be held at both the morning and afternoon sessions on Wednesday, May 2. Outstanding among these sessions will be an unlimited discussion on theater screen viewing factors, the basis for which will be a report by the Screen Brightness Committee which has recently concluded an extensive survey of varying types of theaters in all sections of the country.

Reconstituted Projection Committee?

Other topics on the projection symposia agenda include new techniques and equipment, with particular stress upon their most advantageous ultilization in the theater.

It is expected that an announcement of the reconstruction and revitalization of the Projection Practice Committee of the Society, long inactive, will be forthcoming shortly. The nature of these projected changes has not been revealed.

The forthcoming convention will be marked by the usual social functions, including the semi-annual banquet and a series of activities planned for the ladies.

SMPTE Sound Group Reports

The Sound Committee of the SMPTE has investigated the possible advantages of the blue-sensitive and lead-sulfide types of phototubes for 35-mm theater and 16-mm projector use over the presently used red-sensitive phototubes. This is a continuing activity being carried on with manufacturers of color films.

At the present time, only the red-sensitive phototube is recommended as giving the best all-around performance with present day black-and-white and color sound tracks. Additional data now scheduled for collection may provide the basis for modifying this statement.

Theater Screen Deficiencies

It was brought to the attention of the committee that some recent screen installations in theaters resulted in excessive loss of volume and high-frequency response from the screen horns. The committee investigated, measured the loss of screen samples, and on finding it excessive, aided the manufacturer in modifying his fabric to reduce the sound loss to accepted values.

As the War Standard Z52.44-1945, "Sound Transmission of Perforated Screens" had never been reviewed and processed as an American Standard, the committee circulated it to all known screen manufacturers for approval. Their recent loss data all met the War Standard, and, accordingly, the Sound Committee approved the War Standard with minor revisions, and the new proposal was published in the SMPTE *Journal* for the usual 90-day trial period leading to its eventual adoption as an American Standard.

Texas Leads in New Theater Building

New theaters opened in the U. S. last year totaled 398, while 1,138 drive-ins were added to the active list during the 12 months, according to a continuing survey of the field by *The Film Daily*.

Greatest activity along the new theater line was in Texas, where 40 new regular theaters and 107 drive-ins were opened during 1950, for a total of 147 new situations for the state. California was second with 103 new houses, including 37 indoor theaters.

Complete Strong Line in New Bulletin

A new folder which illustrates and describes their full line of projection arc lamps, rectifiers, spotlights and reflectors has just been issued by Strong Electric Corp., 31 City Park Ave., Toledo 2, Ohio. Free copies are available for the asking.

Theater Television

via the RCA PT-100 Equipment

By TECHNICAL PRODUCTS DIVISION, RCA SERVICE CO., INC.

V. Projectionist Operating Procedure

THE first step in placing the RCA PT-100 theater Tv equipment in operation is to apply the A-C power. After the main A-C switch on the wall has been closed, the POWER ON button on the lower left corner of the projector control panel is pushed, which lights the green pilot light. After a delay of approximately 30 seconds, the white interlock light should light, provided all access doors to the equipment are closed.

Be sure that the individual power switch on the video monitor is ON, and also that the power switch on the Tv receiver is ON, if the off-the-air signal is to be utilized.

Before turning on the high voltage, it is well to check the incoming signal to be sure that it is both adequate and free from undue noise. To do this, press the VIDEO MONITOR, VIDEO SCOPE, and AUDIO MONITOR buttons, on the signal selector panel, for either LINE 1, or LINE 2, whichever is to be used as the source of the program. If off-the-air pickup is to be used, all buttons used should be those for LINE 1.

Steps in Tuning

The Tv receiver must be tuned to the station from which the program desired is to be received. Turn the channel selector switch to the desired channel number and vary the fine control knob until the two green areas in the tuning tube are equal in size and of maximum length.

If a plug-in antenna system is used, it will be necessary also to plug-in the antenna, corresponding to the channel in use, prior to tuning.

If coaxial cable or telephone line is to be used, all buttons pushed should be those for LINE 2. Then set the oscilloscope control knob, located in the projector control panel, to its CAL position and note the height of the space between the two horizontal lines which appear on the oscilloscope screen. Return this knob to its OPERATE position. The signal pattern should have approximately the same height as the space between the two horizontal lines previously seen. This indicates that adequate signal strength is available.

Then set the BLACK LEVEL and CONTRAST knobs on the video monitor panel to produce the best picture. If the picture is unsteady horizontally, readjust the HOR. HOLD control as required to hold the picture steady. Observe the picture on the monitor tube to make sure it is of good quality and reasonably free from noise interference. Listen to the sound at the AUDIO MONITOR JACK to be sure it is normal.

Projector Control Knobs

If both picture and sound are normal, press the VIDEO PROJ. and the AUDIO PROJ. buttons on the signal selector panel, for either LINE 1 or LINE 2, to correspond to those already depressed. Set the control knobs on the projector control panel as follows:

METER to 80 KV;

VIDEO and AUDIO to ZERO;

BLACK LEVEL to point at which it normally operates, as determined by previous experience by the RCA installation supervisor.

Push the VIDEO MONITOR, PROJ. and VIDEO SCOPE, PROJ. buttons.

Rotate the VIDEO control knob on the projector panel clockwise until the picture appears on the monitor tube screen. Adjust this control to produce a normally bright picture.

If necessary, readjust the HOR. HOLD knob on the projector control panel to keep the picture steady in the horizontal direction. Do not turn this control any farther than necessary in the clockwise direction. When the picture is satisfactory, *return the* VIDEO *knob to its zero position* and press the VIDEO MONITOR, LINE and VIDEO SCOPE, LINE buttons which were pressed at first, to return the monitor and scope inputs to the incoming line.

Applying the High Voltage

Now the equipment is ready for the application of the high voltage. Push the HI VOLT ON button. The red pilot light should light. Observe the meter on the projector control panel: it should come up to a steady indication of approximately 80 Kv in three stages over a period of about 30 seconds.

Then turn the METER switch to BEAM CURRENT and leave it in this position except when it becomes necessary to measure the high-voltage supply again. Note that the high voltage will not come in, nor will the red pilot light, if the white interlock lamp is not lighted before the HI VOLT ON switch is pressed.

Operation of the Kinescope protection circuit at any time, whether the high voltage is on or not, will cause the white lamp to go out and the high-voltage supply to be cut off, as shown on the high-voltage meter and by the extinguishing of the red pilot lamp.

Open Interlock Switches

If this occurs, the cause of the difficulty must be located and corrected before the equipment high voltage can be again turned on. Usually this cause will be found to be an open interlock switch on one of the power rack supplies, on the rack horizontal deflection amplifier, on the door of the power supply room, or on the cover of the projector barrel. Otherwise it may be a defective tube in one of the deflection amplifiers, in one of the 400-volt power supplies, in the 300-volt regulator, or in the projector barrel. The same trouble could also result if one of the plugs in the projector barrel should become loose.

To make the changeover, after the film is finished, switch the sound system special input switch over to the Tv projector line. At the Tv cue, turn the VIDEO and AUDIO control knobs on the projector control panel clockwise until the sound level, as indicated on the sound system monitor, is normal and the picture brightness equals that normally expected as determined by previous experience.

Black Level Control

Slight readjustment of the BLACK LEVEL control on the projector control panel may be necessary and should be made as required to maintain normal blackness of the black portions of the picture, and to prevent retrace lines from appearing on the screen.

The VIDEO MONITOR and SCOPE PROJ. buttons may be pressed to show the picture quality and the signal amplitude at the projector barrel, instead of on the incoming line, if desired, or if the picture quality on the theater screen does not seem to be equal to that on the moni-

tor. This checks the operation of the amplifiers and connections up to the projector barrel.

Beam Current Meter

The projectionist must exercise care not to turn the VIDEO control too high, as this causes loss of picture quality and definition on the theater screen. The average indication of the BEAM CURRENT meter should be approximately one milliampere; but this will change with picture content changes. If a picture is composed of mainly white areas, the beam current may be considerably higher than the average value; if the picture is mainly dark areas, the beam current will generally be less than the average value. It will normally fluctuate during the performance.

Post-Tv Show Procedure

After the Tv program is over, rotate the VIDEO and AUDIO controls to zero—this takes the picture off the screen and shuts off the sound. At the same time the monitor and scope will also lose picture and signal voltage if they are being fed from the PROJ. buttons. Switch the sound system special input switch back to the film projector position, and the sound system will then be ready to run film. Turn off the high voltage by pressing the HI. VOLT OFF button. Then turn off the main power by pressing the POWER OFF button, and turning off the main AC switch on the projection room wall.

If the incoming signal is not taken from the Tv receiver, this unit may be turned off with its individual power switch, located near the right end of the Tv receiver panel. Then the receiver tubes will not be used when not necessary. It is recommended, however, that the video monitor panel switch be left on at all times when the projector is in use, with the video monitor switched to LINE position. Thus the quality of the projected picture may be continuously compared with the quality of the monitor picture. This enables the projectionist to determine whether observed picture defects are due to projector faults or incoming signal defects.

Tube-Testing Switch

The 300-volt regulator panel is provided with a tube-testing switch. Rotation of this switch to any of its first eight positions enables the projectionist to check each of both plate currents of the four regulator tubes. The last two positions, 9 and 10, indicate the total output current of the regulator and its output voltage, respectively. However, the total current is actually 10 times the meter indication, therefore, it is necessary to multiply the meter indication by 10 to obtain the actual current value. Also, the meter indicates only half the true voltage, therefore it is necessary to multiply the indicated voltage by 2 in order to obtain the actual output voltage.

These procedures are necesary because the meter scale could not be made high enough to indicate the total current without having the individual tube currents very low on the scale. The voltage indication would also be off-scale if the meter scale indicated the voltage directly.

[NOTE: The sixth and concluding article in this series will appear in the next issue.]

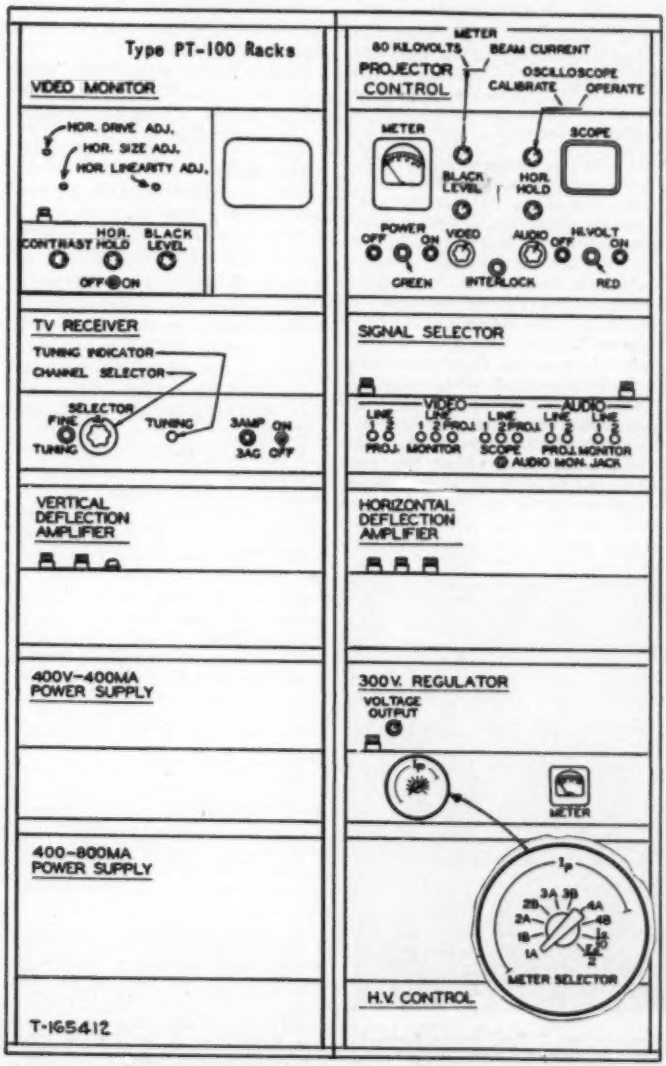


Figure 1 - Operating Controls on Theatre Television Projector

Plan Review of NPA Order M-4

The possibility of amending NPA Order M-4, which placed serious restrictions on any expansion program, in both building and new equipment, brightened considerably when it was announced that the members of the Industry Advisory Committee will meet in Washington on April 25 to discuss the over-all impact of Order M-4 on the motion picture industry.

Strenuous opposition to Order M-4 has developed in the industry, and it is possible that they may be able to effect an easing of its provisions.

IN THE SPOTLIGHT

By *HARRY SHERMAN*

NOT a little space in this department has been devoted of late to the social security aspirations of organized labor, and in particular our own craft. But there is another form of security which is receiving ever-increasing attention from both labor and management—union security.

The importance of this topic is pointed up by a series of articles under the heading "The Labor Angle" now appearing in the magazine *Business Week*, the prime concern of which is Big Business.

The first of this series of articles states flatly that the next big issue in labor relations is "an old one revived. Its generic name is 'union security.' It reaches new and compelling importance now because (1) a long-term trend is coming to a climactic point; (2) some strange fruits of the Taft-Hartley act are being harvested; and (3) mobilization pressures are upsetting the always delicate equilibrium of the union-management balance."

Theme of the article is that the term "union security" is concerned with the "basic power factors in the union-management equation"—not with wages, hours, or even fringe benefits and pensions. Boiled down, the issue concerns that which unions have to offer their members, on the one hand, and what the union has to offer management, on the other hand. The stakes are the predominant control over the individual worker.

We don't suggest that every union man rush to buy *Business Week* for this series of articles, but we hold that they should be required reading for labor leaders in the higher echelons.

• An item that appeared in the N. Y. *Times* several weeks ago relative to the pension plan of the UAW (CIO) interested us greatly. Ben O. Miller, toolmaker for the Packard Motors for the past 35 years, retired recently upon reaching his 65th birthday. As a member of Local 190 (UAW), Miller now receives a monthly pension of $112.70, *including* U. S. social security benefits to which he is entitled. Death benefits of the UAW union are $1000 per member.

Contrast this with the pension and death benefits now in force in two of the larger IA Local Unions—New York Local 306 and Chicago Local 110. Retiring members of Local 306 receive a weekly pension of $30, with a death benefit of $4000 per member; Local 110 men receive a pension of $100 per month, and the death benefit is $2000 per member. The pensions of both these IA Locals are *exclusive* of social security or any other income. We should like to point out here that the New York Local has approximately four times the membership of the Chicago Local, with a correspondingly larger intake, hence the slightly higher benefits.

Pension benefits of the UAW union suffer by comparison with the *unrestricted* benefits enjoyed by the aforementioned IA Locals.

• Pine Bluff, Ark., Local 327 observed its 37th anniversary breakfast at Johnsey's restaurant, Pine Bluff, on April 6. Highspot of the celebration was the presentation of a gold life membership card to Barney N. Burke, charter member of the Local and one of its organizers. Burke was taken completely by surprise, for all plans of the affair were kept under cover until the very last day, when Mrs. Burke persuaded him to accompany her to the restaurant under some pretext or other.

In addition to the membership, which turned out en masse, present were W. P. Raoul, IA secretary-treasurer, representing the General Office; and officers and members from a number of out-of-town Locals. Among the invited guests were the Mayor of Pine Bluff, George H. Steed; Ira Baldridge and Jack Shoemaker, Little Rock Local 204; E. C. Price and Rufus McMoran, Hot Springs Local 326; J. Fitzgerald, Texarkana, Texas Local 383; W. A. Griffin and L. E. Hurt, Memphis, Tenn. Local 144.

BARNEY N. BURKE, VETERAN OFFICIAL, HONORED BY LOCAL 328, PINE BLUFF, ARK.

Acting for the Pine Bluff Local, General Secretary-Treasurer Wm. P. Raoul presents Barney N. Burke, its secretary-treasurer for many years, with a gold life membership card. Looking on may be seen (l. to r.): Herman E. Zappe, bus. rep.; George B. Finley, sgt.-at-arms; V. V. Vaught, pres.; Raoul, Burke, Lewis Hill, vice-pres., and Everett Stanley, trustee.

• The problem of one-man operated projection rooms has come up again to plague Vancouver Local 348. Exhibitors in the Local's jurisdiction, covering an area of 500 miles, have again raised the issue in the legislature, presenting arguments against the existing two-man operation. Local 348 officials are putting up a determined fight to retain prevailing conditions.

• We had the privilege of attending the regular March meeting of Westchester County, N. Y. Local 650, and we came away with the thought that here was a group of men working for a common goal —to make their Local a truly 100% cooperative organization.

Anthony (Tee Dee) Dente, 1st vice-

MICHAEL NUGENT AT CHESTS' PANEL

Addressing a panel of the Mideast Regional Conference of Community Chests and Councils at the Hotel Statler in New York City recently, Michael J. Nugent, secretary of Westchester County (N. Y.) Local 650, stressed the important role played by wage earners in the various Community Chest campaigns throughout the country. Nugent told of the cooperation of the AF of L with these campaigns, and cited the Russell Sage Foundation report for 1943 which showed that wage earners contributed between 25 and 30 per cent of all monies collected by voluntary causes.

president of the Local, was awarded a gold life membership card for his seemingly tireless efforts on behalf of the members. Another highlight of the meeting was the presentation of gold wrist watches to each member of the official family, the presentations being made by Louis Goldshlag, Bernie Rich, and Joe Monaco (business representative of Westchester County Local 366). Invited guests at the meeting included the officers of sister Local 366—Nathan Storch, James Maloney, Morris Steinberg, Joseph Yans, and Joe Monaco, all of whom were warmly welcomed by the membership.

• Up from the ranks is the Horatio Alger story of Dominic Paduano, the new Commissioner of N. Y. City's Department of Water Supply, Gas & Electricity, supervising all electrical installations backstage and projection room operations. Paduano still retains his membership in IBEW Local 3, N. Y. City, and understands the problems that confront our boys both backstage and in the projection rooms. From a working electrician to the post of Commissioner of one of N. Y. City's largest and most important departments is quite a feat in any man's life.

• George Raywood, business representative for Local 316, Miami, has earned the gratitude of many IA men from all parts of the country who spend their winter vacations in Florida. His consideration and concern for the well-being of these visitors to his part of the country have won for him a host of friends throughout the Alliance. We personally know of scores of men who returned to their Locals deeply grateful for his many kindnesses.

• The National Labor Relations Board in Washington, D. C., recently ruled that a union with a union-shop contract can cause the dismissal, without risk, of a person labeled pro-Communist. Heretofore under the Taft-Hartley Act, a union could not compel an employer to discharge a man except for non-payment of union dues. Organized labor contended that this restriction on the union shop permitted management spies, troublemakers, Communists, *etc.*, to stay on the job as long as they paid their union dues. This latest ruling involved a Washington manufacturer and a union member who was accused of signing the Communist-sponsored Stockholm peace pledge.

• The 40th anniversary banquet of Local 203, Easton, Penna., will be held at midnight Thursday, May 10 next at the Forks Township Tavern.

• IA President Walsh was the guest of honor at a dinner sponsored by the motion picture industry at the famous "21" restaurant in N. Y. City on April 10, in recognition of his contributions to the Will Rogers Memorial Hospital, of which Dick is a vice-president and member of the board of directors. Bob O'Donnell, general manager for the Interstate Circuit of Texas and president of the hospital, was toastmaster.

Practically all the circuit and major film company executives turned out to honor Dick, making the event a most auspicious one in that this is the first time in history of our Alliance that an IA president was so honored by the men "on the other side of the fence."

• Toledo Local 228 lost another of its older members—Carol W. Laycock, who died March 31 last. One experiences many a pang at the passing of these old-timers: they worked unselfishly for those who followed them.

• Returning from a trip to the West Coast, Bert Ryde business representative for Buffalo, N. Y. Local 233 (and Mrs. Ryde) stopped off for a visit at the beautiful new clubhouse of Local 279, Houston, Tex. Gracious hospitality is second-nature to the Houston boys, of course, but Bert relates that his reception there ranked as an all-time high in how to do things *right*.

• Projectionists have long desired that their own Projection Practice Committee of the SMPTE have as a chairman a practical projectionist. The SMPTE has recognized the import of this request by the craft by naming as committee chairman M. D. (Obie) O'Brien, assistant director of visual and sound projection for Loew's Theaters.

• The purchase of an additional $100,000 U. S. saving bonds by Chicago Local 110 brings the total to $375,000 such bonds purchased within a 2½-year period. The money was taken from the Local's welfare fund, which provides employer-paid pensions, vacations, sickness and death benefits for its members. "We are glad to put this money where it will do the most good," said Gene Atkinson, business representative for Local 110. "Although we are a relatively small or-

WESTCHESTER COUNTY (N. Y.) LOCAL 650 HONORS ITS OFFICIAL FAMILY

In appreciation for their unselfish services to the membership, Local 650, Westchester County, presented its officials with beautifully engraved gold wrist watches. Shown here holding the gifts are, bottom row (l. to r.): Fred Thome, bus. rep.; Anthony Dente, 1st vice-pres.; I. A. Weiss, pres., and Albert Storch, 3rd vice-pres. Top row (l. to r.): Michael J. Nugent, rec.-cor. sec.; Joseph A. Schoppack, fin.-sec. treas.; Donato De Palo, trustee; Patsy Colarusso, 2nd vice-pres., and Albert E. Bell, trustee. Local 650 covers one of the largest areas in the IA.

ganization, our bond purchases per member are probably the highest in the country. Our welfare fund is in good shape, and we have $200,000 in reserve."

• During a recent visit to the State Building in lower Manhattan, we dropped in the court room presided over by Nathaniel Doragoff, former secretary for New York Local 306, who is now serving as a referee for the N. Y. State Department of Compensation. Doragoff's handling of the various cases impressed us very much, and we predict he will attain even higher levels in his profession.

• E. Clyde Adler, president of Detroit Local 38, was reelected president of the Michigan Alliance, IATSE. A welfare plan, including hospitalization and disability benefits for Alliance members, is now being discussed with several of the larger circuits.

• Frank Constantino, member of Local 362, Paterson, N. J. for the past 30 years, was recently appointed by the Mayor of Paterson to serve on the city's Plant Management Commission for a four-year term. This Commission supervises the operation of the city-owned electric power plant and other municipally-owned projects.

• Strong opposition of New Hampshire theater exhibitors to a bill introduced by Senator Sara E. Otis, calling for a three-man commission to examine and license projectionists, stifled the measure when it was brought before the State legislature. Under the proposed bill the license fee for projectionists would have been $10 for the first year, and $5 per year upon renewal.

• All unions participating in the "Bob Hope Night on Broadway" show, held at the Paramount Theater, N. Y. City, on April 9 for the benefit of the Damon Runyon Memorial Fund, donated the services of their members to this worthy cause. Projectionists' Local 306 and Stagehands' Local 1, IATSE; AFM Local 802, and AGVA Local 1 participated.

• Herbert K. Sorrell, business representative for Local 644, Painters, Paperhangers and Decorators of America, and leader of the 1945-46 strikes in the West Coast studios, was "sentenced" by a trial board of the Painters International Brotherhood, AF of L, barring him from holding any union office for five years because he "wilfully and knowingly associated himself with organizations and groups which subscribe to the doctrines of the Communist party." Significantly, Sorrell was reelected and given a vote of confidence by Local 644—which happening undoubtedly presages a fight with the International.

• Joe Reilly, former business representative for Stagehands' Local 1, N. Y. City, is very proud of his artist son, Frank, who is nationally-known for his paintings and magazine illustrations. In addition to his private work, Frank Reilly teaches a class of 260 students at the N. Y. Art Students' League and holds classes at two other art schools. Artistry and business acumen—a unique combination.

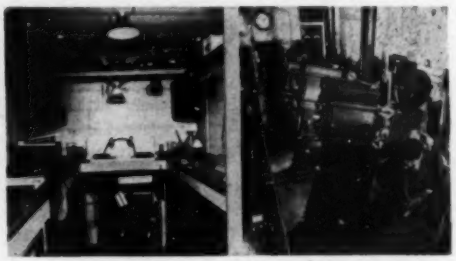
Ray Brian's Fine Collection of Film Projection Lore

One of the finest collections of historical data anent the motion picture projector, and the projection process, has been accumulated over a period of many years by Ray Brian, of Peoria, Illinois. Ray's collection consists of 13 scrapbooks of material which include data on 212 different makes of projectors, including photographic records of 141 of them.

Of the known makes of projectors Ray has 338 photographic records of the various models, many hundreds of patent papers relating to projection—not a few of them humorous in the extreme in that they are fantastic—and hundreds of other pieces of historical literature. The collection is enhanced by books on projection ranging back to 1910, and Ray is now seeking editions 4 and 5 of F. H. Richardson's Handbook.

Ray's hunting ground extends around the world, but the most valuable assistance has come from G. W. Dunston, Norfolk, Va.; A. B. Jefferis, Piedmont, Mo., and the late Jack Peyton of Oklahoma City, Okla. Real relics in his possession are a positive print of "The Great Train Robbery," a Selig Polyscope dating back to 1897, and a Jenkins Phantoscope.

A member of the IA since July, 1914, Ray has been on the job at the Palace Theater, Peoria, for the past 23 years. Married and the father of two teen-agers, Ray lives at 722 West Maywood, Peoria. He would welcome hearing from anyone who has or is interested in historical projection material.



Combination photo-lab and office (at left) wherein Ray Brian experiments and maintains world-wide contacts which have gained him international recognition. At the right is the projection room of the Palace Theatre, Peoria, Ill., where Ray has worked for the past 21 years.

25 Years Ago—April 1926

• New headquarters for the General Office now located at 1400 Broadway, N. Y. City. . . . The 28th IA Convention was scheduled for the Hotel Winton, Cleveland, Ohio, the week beginning June 21. . . . Local Unions in various localities were advised to affiliate with State and Central bodies of the AF of L, in accordance with Article 2, Section 8, Page 41 of the International By-Laws. Failing to do so would make a Local subject to a $50 fine. . . . New England District (3rd) Convention was held in Manchester, N. H., April 25, 1926. . . . Road call effective against the Grand Theater, Morgantown, W. Va. . . . All Locals were requested to furnish the General Office with information pertaining to wage and working conditions.

IA ELECTION

LOCAL 164, MILWAUKEE, WIS.

Glenn C. Kalkhoff, *pres.*; Oscar E. Olson, *bus. rep.*; Walter A. Behr, *vice-pres.*; Robert Lucht, *rec.-sec.*; George Brader, *treas.*; August Mommer, *sgt.-at-arms*; John Black, Norman Habersat, Charles Beggs, Irvin Rotter, *exec. board*; Olson, Kalkhoff, Behr, *del. IA Convention*; Kalkhoff, Olson, *del. Wis. State Federation of Labor Convention*; Olson, Kalkhoff, Walter Plato, George Harris, Chester Millis, *del. Federated Trades.*

PERSONNEL NOTES

RICHARD M. WILSON has been appointed superintendent of the film emulsion coating division at Eastman Kodak Co. Joining Eastman in 1931, Wilson has specialized in coating processes.

JOHN K. HILLIARD, chief engineer for Altec-Lansing Corp., left New York on March 30 for a six-week trip through Europe for the purpose of surveying the development of microphones and loudspeakers.

LINCOLN V. BURROWS, now with Eastman Kodak Co., has been named a consultant to NPA's motion picture division. During World War II Burrows was in the photographic section of the WPB.

BASIL T. WEDMORE, recording engineer for Western Electric in London, England, for more than 21 years, has arrived in New York to assume duties as commercial recording engineer with Westrex Corp.

IA-IP Radio Contest Results

SEVEN widely-separated states, from California to New York, were represented by the ten winners in the first IA-IP amateur radio contest during the week of January 8-13, with the mid-Western men making the best showing. The list of contest winners appearing elsewhere on this page shows the first-prize winner to be Jim Evans (W0GSW) of Local 242, Pittsburgh, Kansas.

Amos Kanaga (W6BAA), secretary of San Mateo, Calif. Local 409, was the inspiration for and a tireless worker in compiling the results of the contest. Amos is also responsible for the ever-growing list of IA amateur radio men which appears in these pages from time to time.

While Amos feels that the contest was a success and more than worth the effort involved, he regrets that the weather during the week selected was, in his words, "a stinker" and militated against an even greater success. Additionally, many contestants did not mail in their log sheets in time to be considered for an award, and some others sent no log sheets at all.

One very beneficial result of the contest was that it enabled many additions to the "ham" list of IA men which is published in IP. Amos asks that when IA men work their brother craftsmen they direct notice to this list in IP and urge them to have their names added thereto.

Many of the contest participants worked their first IA contact, reports Amos. "Whenever the band opened up, especially on 10 meters, there were IA men on the air," Amos added. "Most of the boys hovered around the 28,850 frequency and passed the word along when a new IA station was worked or heard. After midnight, 75 meters was fairly active."

Jim Evans, winner of the top award, works at a big drive-in theater for seven or eight months of the year, and in the winter months he works at theaters in town as an extra man. At the drive-in theater Jim takes care of all the sound equipment.

Started in 'Spark' Days

Jim started in radio as a youngster in the "spark" days, and was very active on 160 before World War II. Since then he operates on all bands through 10 meters. During the war he worked for the Army Air Force on transmitters, receivers and radar.

Pictured herein is Jim's last "ham" set; but at present he is using a Collins 32V2 transmitter with 100 watts input and a Collins 75A1 receiver. Jim recently moved out into the country, and there he uses a 60-foot windmill tower rotary beam on 10 meters, a rotary dipole on 20, and Donplett on 75 and other bands. He belongs to DXCC, has a WAS and WAC, a first-class telephone license and, of course, a Class A "ham" license. He has worked practically every foreign country.

Additional listings of IA amateur radio men can be cleared through Amos Kanaga, 262 Westland Ave., San Mateo, Calif.

IA-IP 'Ham' Winners

W0GSW	James Evans L. 242, Pittsburgh, Kans.
W0BSO	Donald Atherton L. 191, Cedar Rapids, Iowa
W2CYQ	Frank Larham L. 108, Penn Yan, N. Y.
W5OQJ	Norman Olstad L. 279, La Porte, Texas
W3KNY	Harris Good L. 661, Reading, Penna
W8BYT	Leonard Grazier L. 388, Youngstown, Ohio
W5DYV	Bob Belian L. 604, Corpus Christi, Texas
W6PFF	Frank Champlin L. 150, Garvey, Calif.
W0JKU	John Cresap L. 242, Pittsburgh, Kans.
W0BVO	Paul Hunter L. 191, Cedar Rapids, Iowa

WINNER OF THE FIRST IA-IP AMATEUR RADIO "HAM" CONTEST

Jim Evans (W0GSW) member of L. 242, Pittsburgh, Kans., utilizes this set-up to contact not only hundreds of brother "hams" throughout the U. S. but also in many foreign lands.

IA-IP
This Is to Certify That James C. Evans
Radio W0GSW
Has hereby been awarded First Place in First IA-IP Amateur Radio Communication Contest, 1951, for efforts fraternally and in the true spirit of our Craft.
Certified

Representation of certificate awarded first-place winner Jim Evans in the IA-IP amateur radio contest. Ten such certificates (in color) signed by IA President Walsh and Harry Sherman, for IP, will go to the various contest winners.

Current IA-IP Radio Listing on Next Page

Current IA-IP Amateur Radio Listing

CALL	NAME	LOCAL NO.
W1BCE	C. J. Crowley—L. 459	
W1EBO	Woodrow Guile—L. 459	
W1LW	Norman Soules—L. 459	
W1NZE	Arthur Madsen—L. 182	
W1BHJ	Otto Halquist—L. 182	
W1WI	Tom McNamara—L. 505	
W1BVB	Don Fancher—L. 439	
W1IYY	Harold Wyman—L. 96	
W1JBU	George Gravell—L. 96	
W1BTW	J. Roland Lisotte—L. 546	
W1JWN	Theodore Kahn—L. 86	
W1KKJ	Howard Bruya—L. 505	
W2TSN	Victor Bufis—L. 365	
W2WZX	Erich Pattky—L. 244	
W2CYQ	Frank Larham—L. 108	
W2ARP	Fred Ramhorst—L. 534	
W2NFU	Sydney Trisch—L. 306	
W2RUA	Hugh Newcomb—L. 462	
W2QYQ	Alfred Beckett—L. 462	
W2VSQ	Frank Tamborel—L. 306	
W2OCL	Edward Ricca—L. 306	
W2MYI	Mike Revzin—L. 306	
W2ORS	Charles Roop—L.418	
W2DZA	Alex Knight—L. 353	
W2AOM	Jack Garritson—L. 306	
W2NAJ	Peter Hurgon—L. 306	
W2AMB	Fred Huff—L. 306	
W2ZCE	John V. Richards—L. 1 (formerly W3JAX)	
W2RQZ	Frank Lipinske—L. 337	
W2HRJ	Charles Beckett—L. 462	
W2BOR	William Axton—L. 524	
W2HWF	Albert Dietricht—L. 306	
W2BDK	Lloyd Matteson—L. 290	
W2PVB	Kenneth H. Allfrey—L. 290	
W2HP	Jack North—L. 640	
W3KNY	Harris Good—L. 661	
W3MEY	Leo Foran—L. 335	
W3BHV	Nelson Stover—L. 283	
W3JMA	Ralph Rushworth—L. 181	
W3PMY	John Nordine—L. 296	
W3MHE	Charles Gibson—L. 444	
W3BJ	Al Edwards—L. 307	
W3RXT	Bernard Rask—L. 171	
W3TVM	Harry Drew—L. 171	
W4BWN	Bob Cobble—L. 405	
W4HJC	Arlie Bellflower—L. 225	
W4MCT	Jim Davis—L. 552	
W4NOM	Buddy Rogers—L. 225	
W4PKT	M. H. Sanders—L. 507	
W4CIU	Bill Britton—L. 537	
W4FGG	Marvin Storler—L. 144	
W4RFF	Howard Ross—L. 574	
W4RMT	E. M. Karcher—L. 482	
W4KBJ	James File—L. 290	
W4MEP	J. Wyatt—L. 793	
W4FGK	D. Holye Knight—L. 412	
W4DPT	Adrian McCroskey—L. 446	
W5IIP	Pat Talbot—L. 249	
W5DYV	Paul Belian—L. 604	
W5CQ	Ray J. Morrow—L. 597	
W5CQQ	Rajmunt J. Machu—L. 597	
W5IMT	A. S. Johnstone—L. 293	
W5ODA	Bill Couse—L. 450	
W5OQJ	Norman Olsta\—L. 279	
W6BAA	Amos Kanaga—L. 409	
W6UZA	Malcomb Keele—L. 150	
W6DPU	Roy Brann—L. 150	
W6PFF	Frank Champlin—L. 150	
W6PQS	Joe Wilson—L. 504	
W6ALO	Tom Jentges—L. 504	
W6GTP	E. Schwartz—L. 695	
W6MTO	Leroy Wardel—L. 762	
W6DYJ	Ed Pothier—L. 215	
W6IV	Delos Trim—L. 297	
W6RKB	Bob Gillespie—L. 241	
W6YWC	Lewis Howard—L. 162	
W6EFL	A. H. Whitney—L. 150	
W6EAQ	E. L. Kline—L. 150	
W6CAG	August De Grazia—L. 150	
W6CYW	Frank Hemerlein—L. 150	
W6KNI	Cliff Schwander—L. 150	
W6REH	Harry Gould—L. 150	
W6BPT	Roy Pinkham—L. 431	
W6FBW	Frank Amarantes—L. 431	
W6WPG	Robert Hyde—L. 796	
W6IDY	Dom Lucido—L. 241	
W6EP	Leslie Hewitt—L. 695	
W6HK	Frank Creswell—L. 728	
W6YDU	C. R. Putnam—L. 490	
W6BWI	Harry Morse—L. 297	
W6VTX	Ralph Addy—L. 521	
W6EIR	Leroy Ward—L. 521	
W6ZOK	Max Miller—L. 521	
W6FGV	Norman Owens—L. 521	
W6BEP	C. C. Applegate—L. 187	
W6WPG	Robert Hyde—L. 796	
W6ZEN	Floyd McPherson—L. 709	
W6FOP	George Abrams—L. 297	
W6AGN	Arthur Hansen—L. 297	
W6EWU	Tom Wells—L. 297	
W6YBC	Hansen Cressap—L. 297	
W6ZBX	George Kiaser—L. 297	
W6CZK	Ray Baumann—L. 434	
W6CML	Tom Moore—L. 169	
W6IYT	L. H. King—L. 796	
K6CH	H. H. Quackenbush—L. 510	
W6GCF	Charles Busby—L. 599	
W6HUE	Homer Elias—L. 599	
W6UVO	Edward Ives—L. 150	
W6WER	Clarence Woerth—L. 150	
W6RN	Lynn Bradshaw—L. 162	
W7LAT	Fred Jones—L. 720	
W7PEC	Jim Harford—L. 720	
W7AXY	John Murphy—L. 91	
W7ALM	Chester Lamont—L. 446	
W7FJZ	Z. A. Sax—L. 159	
W7HE	Dee Hart—L. 91	
W7HPF	John Gilbert—L. 91	
W7GXN	Edwin McMurray—L. 180	
W7IIJ	Donald Johnston—L. 401	
W7AVM	J. Elmer Newell—L. 429	
W7JTM	J. Allen Evans—L. 294	
W7OAS	George Olson—L. 294	
W7KMO	James A. Furr—L. 294	
W7FTV	Lloyd J. Hagaman—L. 240	
W8VDP	Jack Harwood—L. 160	
W8BYT	L. Grazier—L. 388	
W8NS	Carl Bacon—L. 199	
W8WSL	Denzel Murphy—L. 239	
W8OWK	Edw. Miller—L. 199	
W8EEW	Muriel Murtagh—L. 291	
W8QIX	F. W. McDonald—L. 199	
W8QFK	Jim Robinson—L. 64	
W8BWU	James T. Smith—L. 100	
W9NLP	Rolly Long—L. 110	
W9OL	W. P. Atchison—L. 323	
W9NPG	John Bain—L. 323	
W9LBL	R. B. Connelly—L. 110	
W9EDW	Harold Nelson—L. 221	
W9RTA	Herb Kleinbeck, Sr.—L. 110	
W9FOL	Merrill Smith—L. 110	
W9AZA	Kenneth Mass—L. 721	
W9GQD	Clarence Hawkins—L. 263	
W9DBY	Kenneth G. Alley—L. 421	
W0VGC	H. F. Heckel—L. 230	
W0ZIM	M. Geiskieng—L. 230	
W0GSW	James E. Evans—L. 242	
W0JKU	John Cressp—L. 242	
W0UOP	Clair Rockholz—L. 286	
W0WSH	Herschell Allredge—L. 443	
W0DOL	E. M. Karcher—L. 482	
W0SJK	O. S. Keay—L. 219	
W0SLV	Walker Faussett—L. 395	
W0BTT	R. R. Kerwood—L. 586	
W0WHV	Max Hollingsworth—L. 465	
W0BVO	Paul Hunter—L. 191	
W0QI	E. D. Van Duyne—L. 191	
W0BSO	Don C. Atherton—L. 191	
W0GFN	Ira Hasket—L. 491	

CANADA:

VE3ABV	Jack Snider—L. 173
VE3BAK	F. Winkle—L. 173
VE3BVC	E. H. Whyat—L. 173
VE3BWG	Lou Lodge—L. 173
VE3DBF	M. Winslow—L. 461
VE3OG	H. Horner—L. 173
VE3TE	Tom Burrows—L. 173
VE3APR	Harry McClelland—L. 582
VE5JK	Jack Kyle—L. 295
VE7OT	M. Thoreau—L. 348
VE7US	C. Moorehouse—L. 348
VE7MN	C. H. Richards—L. 348
VE3AYQ	Cecil D. O'Neill—L. 461
VE5RJ	Ron Marchant—L. 300
VE3AHJ	Walt Mann—L. 467
VE7ALW	Merle Wilson—L. 348
VE7APN	Jack Stone—L. 348
VE7APU	Tom Hepple—L. 348
VE7BJ	Edward S. Brooks—L. 348

[NOTE: Additions and corrections should be sent to AMOS R. KANAGA (W6BAA), 262 Westland Ave., San Mateo, Calif.]

Simplex Honors 50-Year Employee

MEMORIES of the early days of motion pictures were evoked at a dinner tendered recently to honor Charlie Linderer on the occasion of completion of 50 years continuous service with International Projector Corp., makers of Simplex visual and sound projection equipment.

Charlie Linderer got his first job in 1901 with Nicholas Power, who at that time was servicing motion picture equipment in a small loft at 115 Nassau St., N. Y. City. The "staff" consisted of Power's daughter in the office, a mechanic, and Charlie, who, in addition to running errands, dabbled in filing castings, drilling and tapping holes.

At night Power showed pictures in social clubs, churches, schools, halls, *etc.* Charlie assisted by carrying the mechanism mounted on a tableboard, while Power toted the accessories—telescoped legs, reels and reel-hanger and the screen. Extreme portability was the first requisite, since practically all transportation was done by trolley cars.

Projection Circa 1901

Screen illumination was supplied by a calcium burner *via* a line fed by oxygen and hydrogen tanks, delivered to the exhibition hall by the company which supplied the gases. A piano player arrived under his own momentum. It was important that the screen be hung without wrinkles, and Charlie says that this was the most tedious part of the job. The projector was generally set up in the middle of the aisle.

The reel of film was clamped to the top of the mechanism by the reel-hanger, and the film passed through the mechanism into a bag fastened to the tableboard. The machine was hand cranked, 10-inch reels were used, and there were no magazines. When the reels were empty, the film was hung on the reel-hanger. While rewinding the film, the lamphouse was moved over to the side and stereopticon views shown until the next reel was ready for screening.

Servicing projectors and showing pictures gave Nicholas Power ample opportunity to see in a very practical way the very serious defects of the many crude machines in use about 1900. An excellent mechanic, he patented many improvements which were later incorporated in the Peerlescope, his first projector. Power was also a smart business man as well as an inventor, and in the course of the years brought out many models of his projector under the name "Power's," which he later made famous.

When the "gold rush" days came, the period during which many people expected to cash in on the motion picture craze by showing pictures in halls, stores, and 299-seat "theaters," Power's business expanded tremendously to the point where he was occupying a large factory on the lower East Side of New York, the address which was to become world-famous in projection circles as "92 Gold St."

50-YEAR EMPLOYE FETED BY IPC

Admiral R. B. Tompkins (Ret.), president of International Projector Corp. presents an appreciatory scroll to Charles Linderer on the occasion of the latter's 50th year of consecutive employment with the company.

Delivery 'on One's Back'

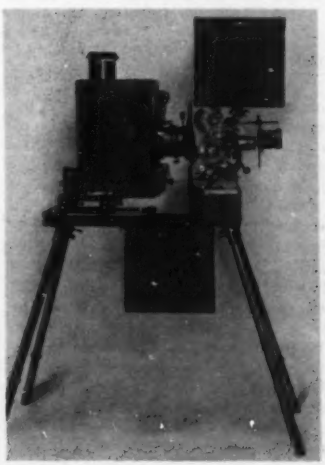
Charlie recalls how the demand for projectors became so great that prospective theater owners would call at 92 Gold St. and personally carry away the machines. The "boom and bust" cycle which plagues every new industry flattened many of these entrepreneurs economically, but not a few of the pioneers prospered and went on to found some of the biggest producing and exhibition companies in the industry.

Charlie's early experience made him realize that the failure to include even the smallest projector part, or to have it mislaid or damaged in transit, might delay the opening of a theater. Such an event could be disastrous to an owner working on limited capital; and Charlie has never forgotten this lesson in all the years that he has headed the packing and shipping department of IPC.

In 1925 the Nicholas Power Co., makers of Power's projectors, and Precision Machine Co., which made the Simplex mechanism, were merged into International Projector Corp., and Charlie Linderer was considered one of the most valuable human assets. Today there are 27 employees with 25 or more years service with IPC.

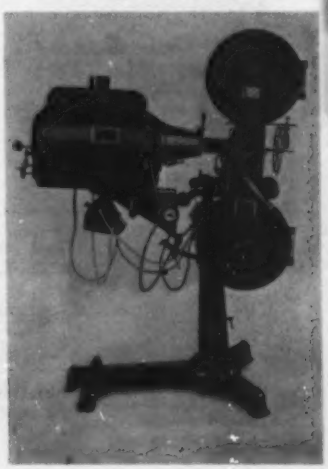
Charlie saw the cycle completed when he was presented with a 17-inch TV set, along with a beautifully executed scroll of appreciation.

The famous Powers No 6 Cameragraph (1909) having a solid-pin movement and employing the then conventional straight arc for illumination.



The 6B was the last Powers made (1920) utilizing a roller-pin cross movement. No. 7 Powers was designed but was never manufactured.

Old standby thru the years—the Regular Simplex (1910). Note old framing lever. The light source shown here is the first McAuley reflector lamp.



GPL Theater Tv Premiere in Pittsburgh

THE world premiere of General Precision Laboratory's theatre television system more than doubled the normal business of the Fulton theatre in Pittsburgh, Pa., key house of the Shea circuit. The biggest, brightest 16-mm picture ever projected to a motion picture screen was produced at the premiere March 19.

A near-capacity Lenten audience came through snow and sleet and rain to witness the finals of the Golden Gloves boxing tournament which was brought into the theatre by coaxial cable direct from New York's Madison Square Garden. The program was not available over Pittsburgh's lone Tv station.

On-the-Scene Atmosphere

An inescapable on-the-scene atmosphere pervaded the theatre during the televised boxing tournament. Wave after wave of cheering, encouragement and advice was shouted at the screen in the crowd's excitement. When one closely-fought bout was awarded to a member of the New York team which was favored in Pittsburgh, a storm of applause swept through the house. Few members of the audience left the theatre before the last fight of the night, shortly before 11:30.

The GPL Videofilm theatre Tv system receives, photographs, develops and projects telecasts to a regular motion picture screen in one continuous operation of only 60 seconds from Tv action to screen projection. The telecast is photographed on 16-mm film, permitting the system to operate at one-fourth the cost of comparable equipment.

The new GPL system is made up of three compact units: a video recorder; a rapid film processor, and a special 16-mm arc lamp projector.

At the GPL premiere, a 21 x 16 foot picture on the Fulton's regular screen registered 4000 lumens of light at the screen after a projection throw of 129 feet at a 16-degree angle. The 16-mm picture was projected to the screen with GPL's regular carbon arclamp, through a 2¼" lens.

Equipment Placement in Room

The equipment is designed to fit easily into the average projection room. At the 1,700 seat Fulton, only minor alterations were necessary to install the three Videofilm units in the projection room, which measures 21′ x 13′ x 9′.

All Pennsylvania state regulations covering projection room equipment were fully observed in locating the 66-inch long video recorder and the 51-inch long developer in a parallel line three feet distant from the room's outside wall. The 16-mm projector was mounted beside the theatre's two regular 35-mm projectors, with a 4-foot span between the center of the already installed 16-mm port and the nearest 35-mm port center.

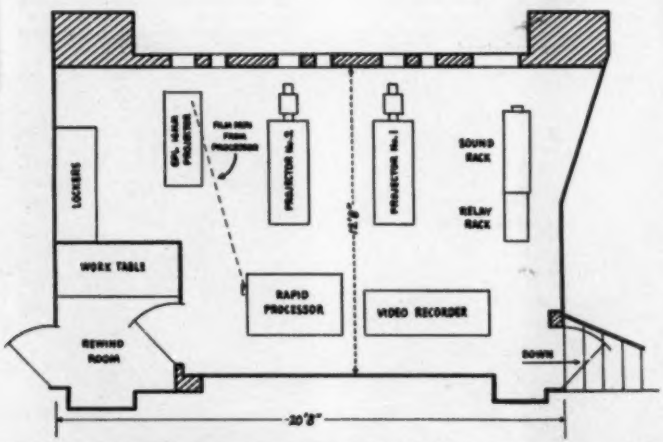
No adjustments were necessary for the theatre's power supply other than the extension of wires carrying the normal power load. An extension of the theatre's restroom pipelines brought circulating hot and cold water into the projection room. No alteration of any kind was necessary to either stage or screen. Sound output was heard through the theatre's regular sound system. A slight alteration of the projection lens matched the Tv picture precisely to screen size.

Although the Golden Gloves event came into the theatre by coaxial cable, the Videofilm system can receive directly off the air on a specially built 12-channel tuner.

Theater Men Enthusiastic

John Walsh, manager of the Fulton Theatre, declared normal business at the theatre had "more than doubled" for the premiere, even though the accompanying feature was classed by the Pittsburgh *Post Gazette* the following day as "Hollywood's ten worst pictures rolled into one." Admission prices were not advanced for the showing.

The Shea circuit is now in a position to extend theatre television productions to its two second-run houses in the Pittsburgh area. The GPL equipment allows the theatre owner to retain complete control of programming. The exhibitor may project the film at once or hold and edit it for later showing. The film may be shown repeatedly or circulated among a number of theatres. The Videofilm system can be placed in operation before the theatre is opened to the public or while other attractions are on the screen.



Layout of the Fulton Theater projection room, showing the location of the regular and the additional Tv equipments

Swiss Eidophore Tv Unit Wins Favor of 20th-Fox

That 20th Century-Fox means business in its tieup with The Swiss Institute of Technology for world-wide rights (excluding Europe) to the Eidophore theater Tv system was stressed when 20th announced its plan to spend $500,000 for further development of the apparatus. Introduction of the system will be delayed until it proves its adaptability for projecting color telecasts.

The Swiss have 18 months in which to come up with a system acceptable to 20th, which will then pick up its option and manufacture the units in America. It is understood that the Eidophore unit is comparable in size with a standard 35-mm film projector, and it would be installed in projection rooms and operated from there.

Battle of the Titans?

The recent deal with RCA still is in effect, announced 20th, but its officials praised the Eidophore system as superior in light, definition and tone scales and is comparable, they say, with the light level of motion picture film.

The Eidophore system has a base covered with an oil film on which images are imprinted electronically. The fluid, described as a "cocktail" consisting of mineral oil and two other unspecified substances, sits on a metal mirror. The process is described as "comparable to the relief images on a Technicolor matrix," with hills and dales created on the Eidophore surface. The light, passing through the oil film, is caught by a grid

of mirrors and focused on the screen with the aid of a carbon arc. The Swiss use 50 frames a second for their demonstrations and are said to be capable of going up to 1000 lines.

New 'Utility' Expands Tv Use

Deeper penetration by Tv into the hinterlands is indicated in a comparatively new development under which communities located up to 130 miles from Tv transmitters, or in terrain considered "dead spots," are being offered service via a new form of "public utility."

System features a community aerial, operated by a business enterprise, erected on a nearby mountain. Signals, too weak for normal reception, are amplified some 500 times and fed through the community by cable. Customers are charged an installation fee ranging up to $125 for connecting a receiver to the cable, and a monthly service charge of $3 or $3.50.

System is being used successfully in Mahanoy City, Pa.; Lansford, Pa.; Astoria, Ore.; Bellingham, Wash., and other places, all 90 to 125 miles from transmitters. Philco Corp. has contracted to sell the system through its own distributors.

BOOK REVIEW

MOVIES FOR TV, by John H. Battison. 5½ x 8¼, 376 *pages, profusely illustrated, indexed, cloth. The Macmillan Co., 60 Fifth Ave., N. Y. City,* 11. $4.25.

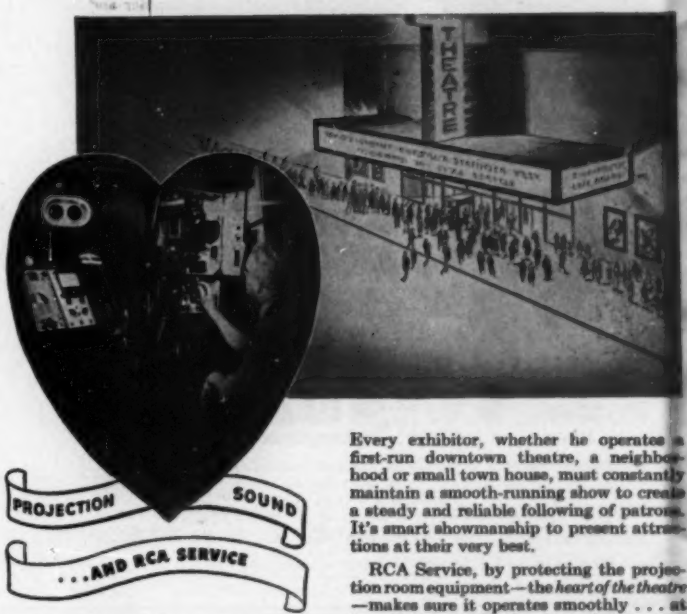
This is one of the best treatises on the application of motion picture film and its technique that has come to our notice thus far. The ever-growing use of film as basic program material for Tv shows is subjected herein to a comprehensive, practical analysis by an author who is eminently qualified for the task. Mr. Battison is an associate editor of the authoritative electronic journal *Tele-Tech,* which activity he has long supplemented by an intense and unflagging interest in the motion picture art.

This book is no mere essay on the purely artistic aspects of motion pictures; it starts from scratch at the production stage and covers in a thoroughly practical yet easily understood manner all phases of technique and the equipment utilized in the application thereof to the needs of present-day Tv broadcasting.

Types of projectors and how they operate, together with a list of possible troubles and how best to avoid them; lighting effects and the necessary accessories; types and proper use of lenses, filters; still and moving titles; fades, dissolves and other special effects; program planning and production—all the multifarious activities necessary for high-quality Tv production are covered in this book in an efficient manner.

Nor are the economic aspects of Tv production neglected, since the author constantly strives to maintain a nice sense of balance as between what *should* and what *can* be done within the limitations of a given budget. It is difficult to imagine any serious worker or patron of the Tv art being without this book. It will pay handsome dividends to its purchasers, and especially to those who are particularly interested in the application of films to the video field.

It's good showmanship to keep the HEART of your theatre running smoothly



PROJECTION SOUND ...AND RCA SERVICE

Every exhibitor, whether he operates a first-run downtown theatre, a neighborhood or small town house, must constantly maintain a smooth-running show to create a steady and reliable following of patrons. It's smart showmanship to present attractions at their very best.

RCA Service, by protecting the projection room equipment—the *heart of the theatre*—makes sure it operates smoothly . . . at top efficiency. RCA Service technicians are skilled in the systematic point-to-point checkup and maintenance of all types of projection and sound equipment regardless of make. RCA Service Plans combine expert technical assistance with comprehensive parts and repair provisions for motion picture and theatre TV equipments.

It costs so little to protect so much

The advantages of RCA Service are yours at a cost so low, a few admissions daily pay for it. *Write for free folder—"Performance Security."*

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A RADIO CORPORATION of AMERICA SUBSIDIARY
CAMDEN, NEW JERSEY

Industry Blasts FCC Ruling on Films, Talent for Tv

New woes on the Tv front were piled on the film industry during the month *via* the pronouncement by the FCC that film companies may be barred from Tv and radio station ownership unless they make films, stories and talent available to existing Tv broadcasters. The general feeling in the industry was that the FCC had over-extended itself by an unprecedented usurpation of authority.

The general attitude of the film industry was perhaps best expressed by Abram F. Myers, board chairman and general counsel of Allied States exhibitor association. Said he:

Typical Exhibitor Reaction

"The report gives the impression that the commission, moved by some undisclosed impulse, hurled a rock at the film companies, but it struck the exhibitors. When a picture is shown on Tv, its box-office value in the area in which it is shown is destroyed. Certainly Congress never contemplated that the public interest could be served by tearing down an established industry in order to help a rival industry which, once the novelty has worn off, may not retain public favor."

Another industry official made the pointed remark that "I don't see NBC making its stars available to CBS." Indication of trouble ahead for the FCC was a letter to the Commission from Senator Wiley (Rep., Wisc.) in which he charged the FCC with "a gratuitous attack against the motion picture industry." Continuing, the lawmaker demanded an explanation "of just how you (FCC) can justify this, if at all. To my way of thinking, it is very unusual and an extra-legal approach to this question."

Newspaper Condemns Ruling

The N. Y. *Times* editoralized that the FCC had over-reached itself and was in effect "insisting that Hollywood must come to the aid and succor of its chief competitor. . . . Apparently the FCC is unconcerned whether Hollywood goes broke in serving as the involuntary sugar daddy of television."

It appears doubtful that the FCC can make its order stick, although its past performances in favoring Tv broadcasters leave little room for optimism on the part of the motion picture industry.

ANSWER TO YOUR TECHNICAL PROBLEMS...

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The Altec Service Man

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CLAYTON BALL-BEARING EVEN TENSION TAKE-UPS

For all projectors and sound equipments

All take-ups wind film on 2, 4 and 5 inch hub reels.

Silent Chain Drives

THE CLAYTON REWINDER

For perfect rewinding on 2000-foot reels.

CLAYTON PRODUCTS CO.

31-45 Tibbett Avenue New York 63, N. Y.

Craft Prime Spur to Sales of Strong Trouperette

Projectionists in both America and abroad have contributed power impetus to the sale of the Strong Trouperette spotlight, utilizing "inkie" light, according to word from The Strong Electric Corp., Toledo, Ohio. This new spot finds application in many situations which could not use profitably the Strong Trouper spot which uses a carbon arc at 10 amperes.

The Trouperette was designed especially for small theaters, schools, night clubs, Tv studios and industrial showings, where physical dimensions and economy are prime factors and where the great light output of an arclight spot is unnecessary.

Salient Advantages of Trouperette

Employing a variable focal length objective lens system, a 5½-inch silvered glass reflector, and a standard 115-volt, pre-focused projection-type bulb, the Trouperette is not subject to the substantial light loss occasioned when a spot size is varied solely by irising. It gives sharp edges from a head-spot to a flood, with horizontal masking control up to 45 degrees in each direction. Other

features include a color boomerang accommodating six slides and a height-adjusting mounting stand.

Detailed illustrative and descriptive literature anent Trouperette spot is available to all projectionists for the asking. Address The Strong Electric Corp., 14 City Park Ave., Toledo 2, Ohio.

NEWS PROJECTIONS

INTERSTATE Circuit, Texas, has dropped its plans to install large-screen Tv in Dallas, Houston, Fort Worth and San Antonio. Reason advanced is that Tv will not become serious threat to Interstate until the national coaxial cable enters these towns . . . Anybody lucky enough to get an NPA permit to build a new theater would run into a 20% increase in production costs over 1950; while repair work is reported to be running 30% more . . . Installment buying is responsible in large measure for box-office decline, v.p. J. Robert Rubin told Loew's stockholders. Estimate is that $20 billion is being paid out by American public today . . . "Too many Westerns" is the complaint of exhibitors. Hoss operas are a dime a dozen, often being dualed on one bill . . . Terrific cost of "live" Tv shows is seen as putting 90% of the programs on film within the next few years.

* * *

While DuMont has cut its factory production from a five- to a four-day basis, ostensibly because of a shortage of materials, a N. Y. City chain store is advertising a premium of a set of dishes said to be worth $49.50 with each Tv set sale! . . . Another theater Tv installation: the RKO Keith's in Washington, D. C. . . . Tv trailers for network use will be available on 14 forthcoming Paramount releases . . . Survey shows that Tv sets are in the homes of one of every three homes with children under 12 years of age . . . Theater receipts for January last were up 7% over same month of 1950, according to tax figures. Movie houses are credited with paying about 76% of the total theater tax . . . Paramount will reinstate trade showings on a 100% basis with each and every picture in all exchange centers.

'Slow Down' Heart Action in High-Speed Color Shots

A new technique for photographing the heart which makes it possible for the first time to see heart action slowed down 133 times has been developed by the Institute of Medical Research, Los Angeles, Calif., it was disclosed in a paper delivered to the Fall, 1950, SMPTE con-

more B.A.*

*(BOXOFFICE APPEAL)

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vention. Said to be a major contribution to the study of rhythm and contraction of the heart through the use of high speed motion pictures, the new technique is expected to be of great value in the study of the action of drugs and stimulants used in correcting heart diseases.

Shoot 3000 Frames per Second

The process involves use of an ordinary commercial high speed camera in conjunction with an extraordinary amount of light. As many as 20 lamps are used, giving illumination of 1,200,000 foot-candles. In comparison, sunlight on a clear day gives illumination of 11,000-foot candles.

The heart is photographed on 16-mm color film at up to 3000 frames per second, compared with a standard motion picture camera which operates normally at 16 frames per second. In a separate process, impulses of the heart action are recorded on a cathode ray oscilloscope and photographed. The films resulting from these processes are projected simultaneously so that the viewer may see and study the living, pulsating heart.

Movie Theaters in the Argentine

There are 2067 motion movie theaters in Argentina, including small parish and open-air theaters, but excluding regular 16-mm theaters, the U. S. Dept. of commerce reports. There are at least an additional 465 commercial outlets in Argentina using 16-mm equipment. Seating capacity of the 35-mm theaters may total 1,200,000, but all houses do not operate every day or throughout the year. More than 1500 theaters, with a seating capacity of 650,000, operate regularly every week. Theaters using 16-mm films vary in seating capacity from 100 to 300.

Projection and sound equipment in the better theaters in the Buenos Aires area is comparatively new and in good condition. Almost every small theater in the interior has old French or German projectors which have been adapted to sound with equipment manufactured in Argentina by Philips (Dutch).

Sound, Visual Projection Needs

The need for new projection and sound equipment is extensive, but effective purchasing capacity is limited. Should the Argentine Government authorize procurement in the U. S. A., only the largest theaters could meet the high prices at the increasingly unfavorable rates of exchange.

Carbons are a very serious problem to the Argentine exhibitor, as none are made domestically, and those imported from Europe are about twice the price of German carbons. All but the most delicate pieces of equipment are manufactured in Argentina. Two machine shops produce a relatively satisfactory 35-mm projector, equipped with Philips sound equipment and sold under the same name. Production ranges from 50 to 70 machines a year, but is not sufficient to meet the demand.

Famous Players Canadian '50 Earnings

Consolidated net earnings of $3,529,514, or $2.03 a share, are shown by Famous Players Canadian Corp. for 1950, compared with $3,071,910, or $1.77 a share, in 1949.

Operating profits, after providing $1,047,575 for depreciation, amount to $4,876,359, investment income to $680,194.

Top Billing . . . Emotionally; Community Chest Drive

There is a small, lonely grave in an old, forgotten cemetery in Graniteville, S. C., marked only "The Little Boy, October 1855." It haunted John F. Watlington of Charlotteville, N. C., who headed the Community Chest drive this year. His inquiries revealed that "The Little Boy," traveling alone on a train through Graniteville, became ill and was taken off the train. A kindly family gave him refuge, but within a few days he died. No one had learned his name or where he came from or where he was going—but sympathetic townsfolk put up the marker.

"It just couldn't happen today," Mr. Watlington said when he uncovered the story. "Travelers Aid, a *Red Feather* service, would be on hand to help the little boy; to see that he had prompt medical and nursing care, perhaps to ease some family trouble that may have lain behind the little boy's tragic journey."

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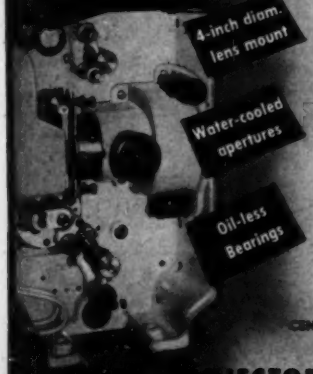

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Speed of Light Re-Evaluated By a New Method Developed by British Scientists

AN experiment recently completed at the National Physical Laboratory* has shown inaccuracy in the normally accepted figure for the speed of light. The difference is not great—only 11 miles per second. It is, however, far from being a matter solely of academic interest, for the speed of light is used for many of the fundamental calculations. The more accurate figure is of immediate practical value in radio and radar.

The speed of light is, in Einstein's theory of relativity, the highest speed at which anything can travel. It is therefore an important physical constant, and its measurement has provided a problem for scientists for many years. Romer first obtained a value of 192,000 miles per second from astronomical observations in 1676.

The first direct experiment measurement was made by Fizeau in 1849. A beam of light was focused on the rim of a toothed wheel, and, after passing through a tooth, it traveled a distance of 4 miles and was reflected back to the wheel. If on its return the light fell upon one of the teeth, it could no longer be seen from behind the wheel. The wheel was therefore speeded up until the light disappeared, and the time of travel was calculated from the rapidity with which the wheel was turning.

Michelson's Famous Experiment

In more recent times, in 1935, Michelson in the U. S. A. made a famous experiment in which a beam of light traveled in a metal tube a mile long, the tube could be evacuated in order to remove the small effect of the atmosphere on the speed. The final value he obtained was 186,271 miles per second. This figure was confirmed in other experiments and has been accepted ever since.

When Dr. L. Essen of the NPL* announced in 1947 that the figure should be 186,282 miles per second, the result was received with some scepticism. He has now confirmed the result, using more refined apparatus, and results recently obtained in Sweden and in the U.S.A. agree with this value to within one kilometer a second. Dr. Essen was concerned with the propagation of radio waves. Radio waves differ from light waves only in their wavelength, and it is generally assumed that they travel at the same speed.

During the war, Dr. Essen was frequently asked what was the correct value of the speed of light. He began to suspect that, although they had been carried out on an impressive scale, the experiments were perhaps not as accurate as was generally believed. He thought that the NPL might do better by using radio waves, and he started work on the problem soon after the war.

The method is similar in principle to Michelson's, but, whereas he used a tube a mile long, Essen's tube is only 7 inches long. A radio wave was sent down this metal tube and reflected backwards and forwards between the two ends. When the time of travel between the ends equals the time interval between successive waves, they build up to produce an electrical resonance which can be detected with very high precision.

New Procedure Evolves

In this experiment, the time of travel is about one ten-thousand-millionth of a second (1/10,000,000,000) or, in other words, the waves follow one another at a frequency of 10 thousand million per second, and it was necessary to measure this frequency with an accuracy better than one part in a million. This is just the kind of problem that Essen was working on during the war and the equipment that was built then was ideally suited to the velocity experiment. The construction of the tube called for very skilled workmanship and its dimensions had to be accurate to one hundred-thousandth of an inch.

The speed of light was not wanted accurately for any practical purpose until the advent of radar in World War II. In radar the distance to an object is calculated from the time taken by a pulse of radio waves

* London, England.

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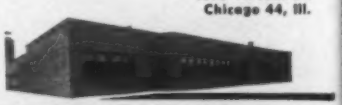

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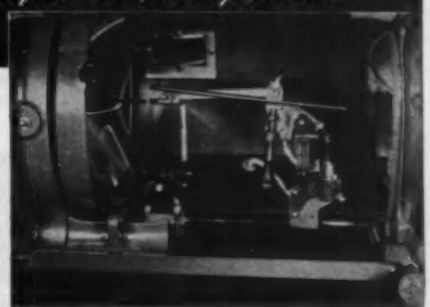

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to travel there and back, the speed of the waves being the same as that of light. The new figure will therefore enable radar to be used more accurately. This will be particularly valuable for aerial survey work where the shape of the ground is plotted by means of radar.

The speed of light is also used in calculating a great number of physical constants. The most significant changes will probably be in astronomy, in atomic research, and in the field of radio.

From "Electronic Engineering" (London)

PROJECTIONISTS ALREADY HAVE TROUBLE ENOUGH

When a projectionist presses the button to open the curtain and get the show underway, he expects the curtain to open—and so does the boss.

Failure of the curtain control equipment at that critical point sends blood pressure zooming, clips many a useful year from the projectionist's life. It also sends spectators' blood pressure skyward, clips many a dollar from the box office take.

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Put a Vallen catalog in the front office now. Just drop a note, asking for a new catalog, to VALLEN, INC., Akron 4, Ohio.

TV WON'T RUIN EVERYTHING

(Continued from page 10)

rusty velvet. Yet, as far back as early Rome, the satirist Juvenal said, "If you want to get to the Emperor, don't lick the boots of a knight, curry favor with an actor."

In Shakespeare's time actors were classed with vagabonds and fined rather than licensed for playing. Yet some of them were the pets of royalty, and Queen Elizabeth asked Will Shakespeare to write a sequel to his *Henry IV* and star Falstaff in it. Which he did.

State of the Theater Today

Today, the theater has innumerable enemies. Yet never before in history have certain dramatists made so much money from such unprecedentedly long runs.

There has probably never been a book or play to rival the sales and performances of *Uncle Tom's Cabin*, but the poor little preacher's wife who wrote it was paid only a small sum for the serial rights, never got a cent out of the numberless editions of the book published in America, or in foreign countries, or from the play which had, I think, four companies playing simultaneously in London, two in Paris and others in other European capitals.

Nowadays, thanks to modern copyright laws and treaties, and the Dramatists', Screen Writers', Radio Writers' and other Guilds, the author is so protected that George Bernard Shaw became a millionaire, and other writers have amassed even more money.

The theater is dead, but just try to get a ticket to any of several theaters in New York! Radio is dead, yet several radio comedians are being paid fabulous sums. As for books, the ex-clergyman, Lloyd Douglas, wrote a religious novel, *The Robe*, which outsold *Forever Amber*, and his *The Big Fisherman* about the Apostle Peter is outselling all exotic or obscene sensationalisms.

Effect of New Art Forms

The point I want to make is this: every new form of art seems at first to destroy the older forms. But, eventually, it increases or enriches our culture and increases the number of participants in it.

From the beginning of mankind and womankind, he or she who could tell a story or act out a character or speak a thrilling piece or sing a catchy song has found an audience—in primeval cave or Metropolitan Opera House. The actor who leapt on an altar and exchanged dialogue with another actor—and thus began the glories of Greek drama—was doing just what an actor does on the modern stage or before a camera, microphone or kinescope.

Entertainers have fed a primeval, in-

General Precision Earnings for 1950

General Precision Equipment Corp., parent company of several large motion picture equipment companies, reported a net operating profit after taxes for 1950 of $871,899, equal to $1.45 a share. Earnings the year previous were $456,485, or 76 cents a share. Total sales in 1950 were $27,072,360, an increase of about $300,000 over 1949.

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satiable hunger, for perhaps a million years, and will be doing so a million years from now. If I'm wrong, tell me so a million years from now.

A similar thing is true in industry. Every labor-saving machine throws certain workers out of employment; but if it succeeds, it vastly increases the numbers employed.

Acceptance of the New

Back in 1779 there was a half-witted fellow named Ned Lud, who earned a pittance by knitting stockings. Along came a villain who invented a knitting machine. So Ned Lud was inspired to attack the machine. In 1811 infuriated working men destroyed all the machines of every kind that they could get at. This movement was given the name of the idiot who inspired it and the machine-haters were called "Luddites." We see their spirit at work everytime a new device is announced.

People ought to accept new inventions and the new customs to which they give rise as they accept floods and earthquakes. It does no good to curse them or berate them. It is better to revise one's habits and adjust one's life to the new conditions.

In Washington's time the expectancy of life was actually no more than 19 years. Today it is 68 years! In Washington's time the biggest city was Philadelphia with 17,000 people. Today we have over 150,000,000 inhabitants, and they are living longer than people used to. As they get older they need more, not less, of such diversions and time-fillers as the theater, the motion picture, radio, television, churches, lectures, concerts.

Yesteryear's 'Drowsing Animals'

In the old days people lived out their lives without leaving their villages or cities. They knew little or nothing of outer life, unless a war brought it home. They were like drowsing animals. In Washington's time, New York had less than 20,000 inhabitants with only spasmodic performances at the few playhouses. Washington rarely missed a play, and he was such a joyous spectator that often the audience would hush and look up at the box and say "listen to the President's laugh!" What a godsend the theater was to that tormented man! What a soul saver it has been to other tormented men and women! Radio and television bring the theater and the motion picture into our homes.

The children of today know far more about vast numbers of things that the most learned men of a century ago were entirely ignorant of. The motion picture, radio and television have an educational power that is infinite, however little recognized or praised. And they *create* a public and a patronage for books, plays, and all the arts.

More, Not Less, Diversion

There is room for *all* the arts and *all* the artists and *all* their managers and patrons. It is inevitable and not altogether regrettable that there should be fierce competition among them, and an unending search for new inventions.

Lucullus, a Roman general enriched by conquests, gave feasts that were famous for the luxury and variety of the countless things to eat and drink. But they were even more famous for the musicians, artists, philosophers, poets and dancers who entertained the guests.

Today the poorest of our citizens is offered a feast for eyes, ears, heart and soul such as would make Lucullus feel like Bill Nye confronted with the choice of *tea or eggs?*

Why are we not rejoicing instead of complaining?

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HONEYCOMB-CONDENSER

(*Continued from page 9*)

particular type of crater brilliancy-distribution.[1] Second, the "apospherical" mirror method suggested by the writer.[2] Third, the Zeiss honeycomb-condenser arrangement described in this issue.

The honeycomb-condenser system is worthy of special attention for several reasons. At first thought the advantages claimed for it seem almost too good to be true. But even if Dr. Schultze's optimistic report is only half true, it still can be maintained that the Zeiss Ikosol arc-lamp seems to me to be the most important advance made in projection lighting since V-E day, not even excepting the ingenious automatic arc-control devices introduced since then. The Ikosol renders such devices unnecessary.

The firm of Carl Zeiss is world-renowned for technical accuracy. The astonishing independence of the performance of the Ikosol lamp from fluctuations in the position of the positive crater and the burning of the trim has been confirmed by F. Hodam of the DEFA-Forschungsabteilung, Berlin.

Here, in a nutshell, is the theory of the honeycomb-condenser system. The "spot"—the image of the positive crater—is imaged not on the picture-aperture but on a heat-resistant glass plate containing 150 plano-convex lenses of rectangular shape. Each of these lenses images the mirror upon the corresponding lens of the plate containing 150 hexagonal lenses. And the hexagonal lenses, in turn, image the rectangular lenses on the aperture. The result is 150 superimposed rectangular "spots" on the rectangular picture-aperture.

Summary of Advantages

The obvious advantages of the Ikosol lamp are:

1. Nearly perfect uniformity of picture illumination and of the color of the projection light are insured by the *superposition* on the aperture of 150 individual rectangular images which intercept *the entire light-beam* thrown forward by the mirror.
2. Remarkable freedom from the ill effects of varying crater position is insured by the fact that *the mirror, not the positive crater,* is imaged by the rectangular lenses on the hexagonal lenses of the lens-plate nearest the projector mechanism.
3. The loss of light caused by four glass-to-air surfaces is more than compensated for by the fact that the spot is rectangular, not circular. This not only prevents the waste of light inherent in a circular spot but also keeps the mechanism cool.
4. Unprecedented ease of operation and servicing.
5. Simplification of lamp design with resulting low cost to the exhibitor.

The possibility of using currents under 40 amps for H-I lighting does not impress this writer as a noteworthy advantage of the Ikosol. There are very few theaters having screens so small that arc currents lower than the minimum of 40 amps could be used to advantage.

Summary of the Disadvantages

The disadvantages are:

1. The distance from the mirror to the honeycomb-condenser plates, the distance separating the two plates, and the distance from the hexagonal-lens plate to the picture aperture are all *extremely critical.* There is absolutely no doubt about this. The lamp must therefore be set up on the projector pedestal with great accuracy, and the distance from the projection head kept within a 2-mm tolerance.
2. Danger of disturbing factory adjustment of the honeycomb-condenser assembly when taking it apart for cleaning. The two plates form a coordinated unit. Azimuth, as well as working distances, must be maintained with the greatest precision.
3. A slightly greater angle of "light-spread" on the screen side of the aperture, requiring the use of slightly larger projection lenses in order to match the efficiency of ordinary mirror lamps, and to avoid lens "vignetting" effects which might partially cancel the uniform aperture-illumination characteristics of the Ikosol lamp.
4. A temptation to ignore entirely the manner in which the carbons burn, thus increasing the liklihood of losing the high-intensity effect. Carelessness in this regard would result in flickering of the arc, greatly diminished brilliance, and a discoloration of the entire picture noticeable on changeovers.

Some of these disadvantages, the second and fourth in particular, can be overcome by competent engineering of the lamp. The Zeiss Ikosol may actually be free from some of these drawbacks. It is too early to be certain of this point, as the lamp was introduced commercially only about a year ago and is unknown outside of the U.S.S.R. and the Russian-occupied zone of Germany.

Film Houses in United Kingdom

A total of 4,583 motion picture theaters are reported to be in operation in the United Kingdom, with an estimated total seating capacity of 4,160,000. Another 109 theaters have recently closed or changed over to stage shows.

Statistics for the first quarter of 1950 reveal that an average of 28,500,000 persons attend motion picture theaters each week. Admission prices range from 3 pence in a few theaters to as high as 11 shillings for the best seats in certain London West-End theaters. In the average community theater, seats are usually from 1 shilling to three shillings, 7 pence. The usual prices for second-run theaters are from 9 pence to 2 shillings, 9 pence. (Pound sterling equals U. S. $2.80; there are 20 shillings in a pound, 12 pence in a shilling). The gross income of motion picture theaters during 1950 is estimated to have been £112,000,000.

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Doctors can now cure half of those who develop cancer if the disease is diagnosed in its early stages. Yet in 1950 some 210,000 families lost a father, a mother or a child to cancer. Many of them—probably 70,000—could have been cured.

To save more lives, we all must help.

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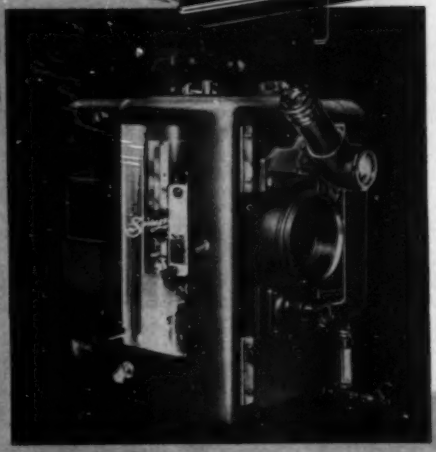

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